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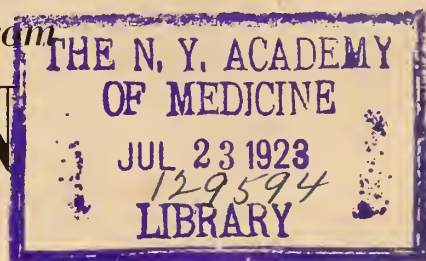
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KEEPING THE FAITH*

JAMES VANCE, M. D., *El Paso, Texas.*

No one knows whence life came, nor whither it goeth, but in its passing it has laid out a highway. That which lies behind is recorded, charted and lighted by the deeds of the mighty who have trod its endless way. This highway extends from darkness, beyond the dim glow of earliest history, to the glaring light of the modern day. That which lies before leads into the trackless future—there at eternity, the trackless future joins the trackless past. Thus nature completes the cycle of all things, for as nature abhors a vacuum, so does it abhor all things incomplete, and that only is complete which is a cycle. History charts and records, and so lights the way of known life in the past, and it is the dim glow of this light that shows the road into the shadowy future.

Along life's highway, from the dim light of earliest history down to the present day, many beacons have been set by the medical profession, and the accumulated light of the whole way has come down as a priceless inheritance to the profession today. In the words of that great teacher, the late J. B. Murphy, our noble predecessors kept the faith—kept the faith so that when a patient consults a doctor today he has confidence in him, not so much because of him individually, but because his pre-

decessors have kept the faith for a thousand years. This kept faith is truly a priceless inheritance which the profession has ever been jealous in guarding. It is dual in nature: (1) keeping the faith with the public, and (2) and especially, keeping the faith with each and every individual patient.

KEEPING THE FAITH WITH THE PUBLIC

The individual can best keep faith with the public by being a good citizen, and, like the individual, the profession can in no way better start keeping the faith with the public than by being exemplary citizens. In these days of reconstruction following the great war—days of bolshevism, socialism and lawlessness—there never was a time when good, conservative, law-abiding citizenship was needed so much as now. Our profession has always been conservative, therefore let us now be too wise to be misled by the radical teachings of the bolshevist, too clear-sighted to be deceived by the impossible and even undesirable idealism of the socialist, and too strong to be led into lawlessness.

Further, in keeping the faith with the public, the profession will continue to give to the public all the great discoveries made in the future as it has done in the past, so that the individual

*"President's Address for The Medical and Surgical Association of the Pacific Coast Roentgen Ray Society at

Phoenix, Arizona, December 1-3, 1921."

who advertises or practices some secret nostrum may at once be branded as a fake and will be recognized as such by every intelligent citizen. The great work of sanitation must go on, and guarding the public health must go on in spite of all the "antis" in the nation. To promote this undertaking the profession as a whole must strive to establish at Washington a Department of Public Health, with a medical cabinet officer at its head. Then, and not till then, can the public health be guarded as it should be.

There is no question but that the profession has the confidence of the public as a whole. All great crises in the past have shown this, and the recent great war was no exception. It is equally true that the profession has not the confidence of all the public all the time, because many people stray at times to one or more of the various cults, till they have been filched of all their money or else get something seriously the matter with them, when they return to the regular profession.

It is the profession's duty to give to the public every therapeutic measure that is found of merit in preventing or curing disease. It is partly due to a failure on our part to meet all these requirements, that the cults are patronized as much as they are. There is some virtue in all the cults, but the virtue is so covered by fraud and ignorance of the cult practitioners that more harm than good results. Even faith cures have their virtues, but as such, faith cures can never be practiced, nor even sanctioned by the profession because the temptation to fraud is too great.

Osteopathy, neuropathy and chiropractics owe their very existence to the fact that in this country kinesitherapy has been almost entirely neglected by our profession. The busy practitioner has not the time to give massage, Swedish movements, exercises, nor any of the other movement therapeutics covered by kinesitherapy, yet this branch of therapeutics is of the very greatest value to a large number of cases, when the exercises are well chosen and properly administered. In every town of any size we should have one or more doc-

tors, who are skilled in all the branches of kinesitherapy, and to whom the busy practitioner, surgeon or other specialist could refer suitable cases for treatment, and be assured that the patient so sent would receive skilled treatment by a doctor trained in physiology and pathology, who would recognize and understand the patient's true condition and so be guided in his treatments. As it is now, these patients wander off to one or more of the various cults where they are generally filched of all the coin they can raise, and receive but little in return. All the virtues of osteopathy, neuropathy and chiropractics, represent only a small portion of the benefits properly selected cases could receive from doctors well skilled in all the branches of kinesitherapy.

So far as we know, Rush Medical College is our only medical school which is giving thorough courses in kinesitherapy. We hope that our other great medical schools, if not now teaching this important branch of therapeutics, will awake to the importance of this subject and give it proper place in their curriculum. This field offers great opportunity and liberal remuneration to doctors thoroughly trained in kinesitherapy, and their work will be of the greatest benefit to humanity.

In keeping the faith with the public all the virtues of the cults should be administered by the profession, free of the sham and fraud that now destroys them as practiced by the cults.

KEEPING THE FAITH WITH THE PATIENT

The whole field of medical science is entirely too large for any one man to master, much less practice all its numerous branches; but a man, after a suitable training in the fundamentals of the whole, can master one branch of the subject. Having mastered this one branch of medicine in both theory and practice he becomes a specialist and is better able to care for cases in his line than any one possibly can who tries to cover the whole field.

Our profession is not a business, and never can be prostituted as such. In business, nothing is done without the

expectation of profit, but we stand, in relation to our patients, as a friend in need. We will not violate this sacred relation, and whether the patient be rich or poor we are obligated to give him the best service possible. Therefore, when the nature of his case has been determined, if we are not specially prepared to care for his needs, we will send him, without regard to personal gain, to the man best prepared to cure him.

Fortunately, the day of covering up ignorance with mysticism is gone, and the why and wherefore of a line of treatment is explained to the intelligent patient because he is thereby encouraged to carry out a line of treatment, even though it may be difficult, because he can see and appreciate the results obtained. The thoughtful practitioner gives just as few and simple drugs as possible, and only those that are tried and true, and withdraws those drugs just as soon as the patient can do without them—just as the surgeon casts aside the splints of a broken leg as soon as the fracture has united.

The drug nihilist is ridiculous, but he is no more ridiculous than the twenty thousand drugs and preparations of the United States Dispensatory. The great majority of these drugs and preparations should be discarded so that the student could learn more about those really worth while.

In keeping the faith with our patient we will be very conservative in prescribing the multitudinous new preparations and new remedies presented to us by the loquacious representatives of the great pharmaceutical houses. It would seem wise for the Council on Pharmacy and Chemistry of the A. M. A. to test the merits of all new drugs before they are allowed to be detailed to the profession.

In like manner the surgeon will operate on the patient only when it is the best and surest way to cure him, nor is there any excuse, these days, for a doctor desiring to become a surgeon, to perform operations for which he has not been properly prepared.

In this day of laboratory diagnosis

the doctor is only too likely to lose sight of the patient himself—the patient's own peculiar individuality—just as different from every other patient he has ever seen, as the patient's face or thumb prints differ from all the other millions of men or women. Often the patient needs neither surgery nor drugs, but does need perhaps plenty of exercise, or mental diversion to break the ennui of a too monotonous life. Perhaps it may even be the modern doctor's arduous duty to teach the patient to think correctly, for correct thinking has more to do with good health than any one at first thought would suppose.

There is no possible way in which we can better keep the faith with our patients than by keeping them at home and so keep our specialists busy and at the highest tide of efficiency. The day has passed when it was necessary to send our unusual cases hundreds or perhaps thousands of miles away to some famous clinic for treatment. Here in the southwest we have specialists, in every line of work, who are as capable as any in the whole land and do as good work as is to be found anywhere.

Do not send your patient away to some famous clinic, where he is known by a number, receives no individual treatment, and no adequate after treatment. Send your patient to your home specialist, from whom he receives personal attention. The specialist is interested in the patient himself and in the doctor who sent him. The patient is among his friends, who are a great comfort to him, and he is not a stranger in a strange land, as he is at the far-away famous clinic. Further, during his convalescence, he receives adequate after treatment from his home specialist and family physician, no matter whether his convalescence be short or protracted.

Do not think that the famous clinics always get the best results obtainable, for they do not. Unfortunately, they are but human and have their failures as well as our home specialists. These great clinics are marvellous machines

for the cure of diseases, but never yet has any machine, no matter how perfect, equaled the individual care and personal attention of our home specialist and family physician. Therefore, let us mutually support our specialists and general practitioners because our patients' needs are best cared for by the combined efforts of these two.

While we are now giving the best possible attention to our patients, it is freely admitted that in the management and care of the sick, there is much

ground for healthy improvement, which we are all striving to cultivate. Were this not so, there would be no advance in medicine, but constant retrogression. Within the limitations of mortals, yet guided by the white light of science such as existed from century to century and decade to decade in the past, our predecessors have kept the faith; the profession is keeping the faith today, and please God will continue to keep the faith so long as civilization shall endure.

FRACTURE OF THE PELVIS

COMMENTS ON COMPLICATIONS, MORTALITY AND ULTIMATE RESULTS.*

JOHN E. BACON, M. D., F. A. C. S.; Miami, Arizona.

The purpose of this communication is to invite attention to fracture of the pelvis as a major, or complicating, lesion in injuries resulting from falls of rock, crushing injuries received in accidents about haulage systems in mines, falls from considerable heights, and automobile wrecks. In view of the short time at our disposal it seems best to omit the classical description of these lesions, as found in all text books, and to confine our comments to impressions from our own experience.

ETIOLOGY: Fracture of the pelvis is most frequently caused by direct violence applied to any part of the pelvic ring, such as would follow injury from

falls of rock or falling of the patient from a considerable height; also injuries resulting from crushing of the pelvic ring between a stationary and moving body, such as a post and a moving mine car, or automobile accidents where the pelvic ring is caught between a heavy weight and the ground. A close analysis of our series of cases does not indicate that force applied laterally is any more apt to produce a fracture than force applied in an antero-posterior direction.

In this series of cases, the pubic bone was found to be fractured more frequently than any other bone of the pelvis, occurring nineteen times. The ilium was fractured eighteen times and the

*Read before the joint meeting of The Medical & Surgical Association of the Southwest and The Pacific Coast Roentgen Ray Society at Phoenix, Arizona, December 1-3, 1921.

ischium nine times. A fracture of the ascending ramus of the ischium is more apt to be overlooked than a fracture of any other bone of the pelvic ring.

DIAGNOSIS: The diagnosis of this lesion may be very simple and it may be extremely difficult. We have found that careful consideration of the history of the accident and of the condition of the patient on admission leads us to suspect a fracture of the pelvis in many cases in which this lesion would be missed without systematic X-ray investigation. All of these cases present shock, and any degree of shock out of proportion to the complicating lesions should lead one to suspect fracture of the pelvis. Hemorrhage from the urethra or vagina should put one on guard at once, and a slowly increasing ecchymosis in the pubic and perineal regions is almost pathognomonic of fracture of the pelvic ring. Hematoma of the perineum, in the absence of ruptured urethra, is quite common in cases in which fracture of the pelvis may be suspected but are of far less significance in the diagnosis than the ecchymosis referred to.

In the non-fatal cases, it is seldom that a gross deformity is to be observed by inspection or found by ordinary palpation and, when we have reason to suspect fracture of this region, we proceed methodically with palpation, covering the separate bones comprising the pelvic ring. In this way, a fracture of the crest of the ilium is easily demonstrated; as a rule; fracture of the horizontal ramus of the pubic bone can sometimes be detected and, by means of a rectal or vaginal palpation, fracture involving the ischium can nearly always be made out, but no examination can be considered as ruling out this fracture without a thorough X-ray investigation of the entire pelvis.

It is rare, in our practice, that we have received a patient having fracture of the pelvis without other lesions, usually fractures, of a nature so severe that the patient could be studied with relation to his pelvic fracture alone. And it should be borne in mind that, in such patients, it is comparatively easy to overlook the pelvic lesion entirely, as

we have done in the following four cases in this series:

Case 10. This patient was buried in caving ground and presented so many and such serious contusions and lacerations over the chest, back and arms, that the lesion in the pelvis was missed for two weeks and only picked up accidentally in the course of radiographing his sacroiliac region for some explanation of the pain which he suffered there.

Case 12. Also injured by being buried in a fall of rock. Exactly the same conditions occurred and the man left the hospital in sixteen days, but not getting along as satisfactorily as was expected under out-patient care, was radiographed for pain in the back, and a fracture of the ascending ramus of the ischium was detected, five months after the accident. The fracture was healed when discovered but the sacroiliac symptoms persisted until the case was lost sight of.

Case 30. This patient suffered a fracture of the right femur about four inches below the neck, dislocation of the right shoulder, severe laceration of the right eye and, in the course of radiographing his right femur and hip joint, an unsuspected fracture of the right pubic bone was discovered, two weeks after his admittance to the hospital.

Case 32. This patient gave a history of only a short fall, landing astride an iron bar in a grizzly. He presented a lacerated wound of the scrotum in the median line, also a hemorrhage from the urethra and, on account of the comparatively trivial force exerted in his fall, and not developing the ecchymosis which we have learned to look upon as characteristic, he was allowed to leave the hospital without the customary radiogram. It was only upon his failure to recover more rapidly that he was referred for X-ray, and a comminuted, quite badly displaced fracture of the ascending ramus of the ischium on the left side was discovered.

COMPLICATIONS: Of lesions of the skeleton and ligaments complicating fractures of the pelvic ring, the most important in our experience, as regards disability persisting to an unusual

length of time, is tearing or relaxation of the anterior and posterior ligaments of the sacroiliac joints. Whether actual rotation of the sacroiliac joint exists in these cases is an open question. We have learned to disregard entirely, from a diagnostic or prognostic point of view, the X-ray findings about the sacroiliac joint in the absence of fracture involving the sacrum or the transverse process of the fifth lumbar vertebra. Visible or palpable deformity is so rare that we have seen but one case in our series in which we believed we could demonstrate rotation of the ilium on the sacrum. Slipping of the fifth lumbar vertebra forward has not been demonstrated in any of the cases in this series but has been suspected repeatedly, on account of the length of time the disability has persisted in three cases, none of which has ever returned to work so far as we could trace them (Cases 9-10-14). There is, however, some lesion about the sacroiliac joint which cannot be demonstrated by X-ray, by physical findings, or by electrical examination which leads to long continued disability in about twenty-five per cent of cases of fractures of the pelvis and also in cases of severe trauma to the pelvic region without demonstrable fracture. In five cases in this series, the patients never returned to work and were lost sight of; all of these complaining of sacroiliac pain, weakness of the back, pain and weakness in one or both legs. (Cases 5-10-12-14-17).

Of the lesions to the soft parts, the most frequent complication in this series was rupture of the urethra or bladder. One of these lesions occurring in eight cases of this series, or 25%, four of them among the fatal cases. Of four non-fatal cases, the lesions were treated by immediate operation comprising suture of the bladder, suture of the urethra over a catheter, and adequate drainage, and in no one of the four cases was the convalescence prolonged by reason of this accident and, so far as we have traced these cases, there has been no permanent disability caused by sequelae of this complication.

Hemorrhage from tearing of soft tissues or even blood vessels occurred in

six of our cases; one case actually bleeding to death from a tear in the femoral vein. We have found that hematomata in the perineal and pubic regions outside the peritoneal cavity are not more prone to infection in this region than in any other. Severe hemorrhage within the peritoneal cavity usually marks a fatal case.

MORTALITY: The mortality in this series consisted of five cases, or 15.6%. (Cases 6, 7, 16, 18 and 26).

By referring to these case histories it will be observed that the mortality from fracture of the pelvis is very largely due to the accompanying complications. Two of these cases suffered fracture of the lumbar vertebrae and two had ruptured bladders, with extensive tearing injuries of the pelvic structures and severe hemorrhages; one had a crushing injury of the chest which, of course, was the major lesion in this case, with ruptured diaphragm and crowding of the intestines into the left chest. So that an ordinary fracture of the pelvis, without severe complications, may be said to present comparatively slight hazard to life.

ULTIMATE RESULTS: Of this series of thirty-two cases, we have been able to trace nineteen which have returned to their usual occupations and, in these nineteen cases, the average time lost was five and seven-nineteenths months. The element of delay entering into the settlement of compensation cases probably has increased this average time lost considerably, so that it is probable that the disability following a fracture of the pelvic ring alone would not exceed that following a simple, uncomplicated fracture of the femur. Most of these nineteen cases have remained under observation while working so that we are able to state that, even with a quite badly displaced fracture of the pubic bone or ischium or crest of the ilium, the working capacity may be entirely restored and no permanent limps or other evidence of disability remain.

Of the thirteen cases in this series which did not return to work, five died, leaving eight cases, the ultimate fate of which we do not know. Of these eight cases, however, five were in the sacro-

iliac group, unable to work for a year or more on account of pain and weakness in the back. The remaining three left the district on being compensated and were not traced.

TREATMENT: The treatment of these cases, as will be observed from the complicated lesions, resolves itself into the treatment of shock which they all present and, secondarily, the appropriate care of the multiple lesions of the bones and soft parts, which need not be described.

As far as the pelvic fracture is concerned, we have learned that there is no such thing as the complete reduction of a fracture of the ramus of the ischium, the rami or body of the pubic bone, or the body of the ilium near the acetabulum by closed methods. It is possible to adjust completely, in slight cases, and partially, in more severe cases, the crest of the ilium, but it is difficult to maintain this adjustment by any contrivance that we have tried.

We have learned to dispense entirely with the use of the plaster cast in treating fracture of the pelvis for the reason that it does not assist in any way in maintaining the position of the bones, even if partial reduction is accomplished, and it does cause the patient undue pain and distress.

We have learned to avoid the classical adhesive plaster strapping in these cases because lateral compression from whatever source tends to aggravate the deformity, to increase pain, and to favor infection because of abrasions of the skin.

We have not found it advisable to attempt open operative reduction in any of these cases, and in retrospect believe that our decision has been wise. In Case 28, in which it was necessary to open the bladder and do a retrograde catheterization in order to locate the severed urethra, it was possible to observe carefully the condition of the fracture of the ramus of the right pubic bone, which was badly splintered, and at that time effort was made to adjust these fragments by means of a bone skid or forceps, but, after some effort, the utter impossibility of improving the

relation of the fragments was recognized and the wound was closed. In spite of a much comminuted and splintered horizontal ramus of the right pubic bone and of a badly comminuted fracture of the right ischium, both compounded by operation, this case healed without infection, was discharged from the hospital in thirty-two days and applied for permission to return to work in three months from the date of his injury, walking without a limp and able to bend forward and touch the floor with the tips of his fingers and to perform any normal movement with the muscles attached to the pelvis.

Our treatment is based upon a full consideration and care of the shock, and aims to avoid any manipulation or appliance that will increase or perpetuate the shock. This, we regard as vital. These patients are placed upon a fracture bed which is capable of being raised and lowered for nursing purposes, are placed in the most favorable position for being comfortable, and left alone. After three weeks, treatment by massage, passive movements, and the interrupted faradic current is instituted. At five to six weeks, active movements are encouraged, and the aim of the reconstructive treatment is to re-educate the muscles, the origins of which have been displaced, to a new function, and it is surprising how rapidly these cases will respond to careful, persistent, mechano-therapy.

CONCLUSIONS

1. Fracture of the pelvis, as a major or complicating lesion, is far more frequent in injuries received in mines by falls from a considerable height, and in automobile accidents, than we have commonly supposed, and should always be thought of at the first examination of the patient so injured.

2. Fracture of the pubic bone is most common; fracture of some part of the iliac bone is next common, and fracture of the ischium least common.

3. The most frequent complication is a lesion of the sacroiliac joint. The next most frequent complication is injury to the bladder or urethra.

4. Uncomplicated fracture of the pelvic bones is not followed by a period of disability greater than that of an uncomplicated fracture of the femur, and restoration to full working capacity may be expected in about eighty per cent of all cases within four to six months.

5. Treatment of these cases should be so managed as to facilitate recovery from, and guard against, undue prolongation of shock so that plaster casts and tight adhesive dressings seem to be distinctly contraindicated.

6. The ultimate recovery of these patients can be distinctly hastened and time loss shortened by persistent treatment by the use of passive and active movements, massage, electricity and, finally, reconstructive gymnastics.

REPORT OF CASES

Case 1—G. B., German, aged thirty-three, single, injured in April, 1904, by being shot while defending some mining claims in the mountains between Tombstone and Bisbee. He was removed to Bisbee, given emergency treatment and sent to the County Hospital at Tombstone five days after the injury.

Family history negative and previous personal history negative. Examination revealed that the bullet had entered through the anterior part of the scrotum on the right side, had opened the membranous urethra, shattered the ischium, wounded the rectum, and passed out through the right buttock.

The patient was in active efflorescence of infection in all these wounds and it seemed incredible that he could survive this injury, considering the condition in which he was received. However, under adequate drainage and careful dressing, eventually the fistula into the urethra closed, the opening into the rectum closed, and after removal of numerous pieces of necrotic bone, the entire wound closed and the man left the hospital in five months, walking with scarcely a limp. He has been able to work as a prospector and miner ever since, and is still living.

Case 2.—R. S., Austrian, aged twenty-four, injured June 12, 1911. Admitted to the hospital on hour after the accident.

Personal and family histories negative. Diagnosis of fracture of the descending ramus of the pubis, comminuted fracture of the right pubic bone, and a rupture of the urethra was made.

The urethra was sutured immediately over a catheter, the case ran an exceptionally kindly course and the man was discharged from the hospital July 19, 1911, to the out-patient department.

He was compensated and cleared for work August 26, 1911. Time lost seventy-four days.

Case 3—C. B., Mexican, aged twenty-seven, married, injured August 18, 1911. Admitted to the hospital in about one hour after the accident.

Family and personal histories unimportant. Examination revealed rupture of the internal lateral ligament of the right knee joint and multiple contusions of the pelvis, hips, and back. Radiograph revealed a horizontal fracture of the right pubic bone but in spite of that he was discharged from the hospital September 19, 1911.

This case was compensated and left the district, so that the time lost is not obtainable.

Case 4.—J. R., Spanish, aged twenty-four, injured October 7, 1911. Admitted to the hospital within one hour after the accident in a dying condition.

Family and personal histories negative. Examination revealed crushing injury to the chest with multiple fractures of the ribs, bilateral fracture of the pelvis and a ruptured diaphragm.

This case expired about one and one-half hours after admission.

Case 5.—B. B., Mexican, aged thirty-two, married, injured March 5, 1913. Admitted to the hospital shortly after the accident.

Family and personal histories unimportant. Examination revealed a fracture of the ilium and involvement of the sacroiliac joint, right side.

This patient was dissatisfied with hospital care and was removed by his friends on March 15, 1912, and lost sight of. Total time lost unknown.

Case 6.—B. K., Slavonian, aged twenty, single, mucker, injured 2 a. m., March 14, 1913, by being caught between two cars and crushed. Admitted to the hospital within two hours after the accident.

Family and personal histories negative. Examination revealed a fractured pelvis with the line of fracture extending into the left ilium, ruptured urethra, extravasated blood into the cellular tissues of the pelvis.

The urethra was repaired over a catheter and the case progressed without incident, leaving the hospital on April 15, 1913, to out-patient treatment. He was cleared for work June 13, 1913; time lost three months.

Case 7.—P. K., Austrian, aged twenty-four, single, injured December 14, 1913. Admitted to the hospital within forty minutes after the accident.

Family and personal histories negative. Examination revealed a puncture wound through the thinnest part of the left ilium

from which active haemorrhage was observed. He had a ruptured bladder, and the right ureter was stripped and torn. This man continued in active hemorrhage from the small puncture wound on the left side until he died, about an hour after his admission.

An autopsy was obtained in this case and a splintering fracture of the right ilium was discovered, the spicules of bone having wounded the femoral vein on the right side which contributed the blood which flowed from the punctured wound of the ilium on the left side. The bladder was torn intraperitoneally, and the ureter stripped up and torn off about two and a half inches above its insertion into the bladder.

Case 8—D. P., American, aged thirty-three, married, iron-worker, injured February 17, 1916, by falling from a scaffold onto rough ground. Admitted to the hospital one hour later.

Family and personal histories unimportant. Radiograph revealed a comminuted fracture involving both rami of the left pubic bone.

This patient was discharged from the hospital, walking, on April 5, 1916; was compensated in June, and resumed his work in July. Total time lost five months.

Case 9—P. S., Austrian, aged thirty-three, married, injured February 21, 1916, by falling rock. This patient was buried for about four hours. Admitted to the hospital about four and a half hours after accident.

Family and personal histories negative. Physical examination, confirmed by radiographs, revealed fracture of the ascending rami of both right and left pubic bones, close to the symphysis; contusions to right and left hips, profound shock and haemorrhage from the urethra but the canal was not interrupted.

This patient left the hospital April 15, 1916, was settled with and left the district seven months after his accident. Further time lost unknown.

Case 10—J. B., American, aged twenty-three, single, motor-helper, injured 4 a. m., March 13, 1916, by being buried in caving ground. Admitted to the hospital the same day.

Family and personal histories negative. Examination revealed severe contusion to the right chest over clavicular region, contusions and lacerations both forearms, abrasions both hands, and sacroiliac strain involving both joints. In this case, the diagnosis of fracture of the pelvis was missed for a couple of weeks and only picked up in the course of radiographing his sacroiliac region for some explanation of the pain which he suffered in that region.

He was discharged from the hospital June 6, 1916. His case was adjusted December 21, 1916, and he left the district.

This is one of those cases which, while presenting no displacement or signs of visceral injury, nevertheless, become chronic invalids on account of the pain in the back and weakness in that region. After leaving the district, this patient engaged in business and was heard from as late as 1919 still incapacitated for hard work by reason of pain and weakness in the back.

Case 11—F. C., Mexican, aged forty, married, timber-helper, injured 10 a. m., April 16, 1916, by being caught between two cars. He was admitted to the hospital at 11 a. m.

Family and personal histories unimportant. He presented a laceration of the right side of the forehead, contusion of the pelvis for which a radiograph was taken, which revealed a T. fracture of the right iliac bone, extending from the anterior superior spine to the sacroiliac junction, a contused area of the gluteal region and much extravasated blood in the perineum. There was no rupture of the urethra in this case and the hematoma readily absorbed.

He was discharged from the hospital May 25, 1916, and treated as an out-patient from May until January of the following year, when he was able to resume his work and was given his clearance. Time lost nine months fourteen days.

Case 12—J. J., Austrian, aged thirty, married, injured May 5, 1916, by being caught in a fall of rock. Admitted to the hospital one hour after the accident.

Family and personal histories unimportant. Examination revealed multiple contusions and lacerations about pelvic region and about torso. The contusions and abrasions healed rapidly and the man left the hospital to out-patient treatment May 21, 1916.

He did not get along satisfactorily and was readmitted to the hospital October 26, 1916, when the radiograph revealed a hitherto unrecognized fracture of the ascending ramus of the ischium.

This man continued to present weakness and difficulty in bending and was compensated eight months and eleven days after his injury, and left the district, so that the total disability is unknown.

Case 13—G. D., Italian, aged twenty-six, single, injured June 23, 1916, by being in a wreck of mine cars underground. Admitted to the hospital within an hour.

Family and personal histories negative. He presented a compound fracture of the right ilium, contusions and abrasions of the entire face, chest, arms and forearms, hematoma over right ilium, shock. The fractured pelvis in this case pursued an uneventful course. The hematoma was partly evacuated and primary suture of the wound was made.

The patient left the hospital September 2, 1916, was treated at the dispensary for two

months and was then compensated and left the district, seven months after his accident. Further time lost unknown.

Case 14—A. L., Greek, aged twenty-seven, single, machineman, injured 6:30 a. m., October 13, 1916, by being buried by falling rock. Admitted to the hospital 7:30 a. m., in shock.

Family and personal histories negative. The diagnosis was crushing injury to the back and pelvis. Subsequent radiographs revealed radiating lines of fracture through the ilium and evidence of sacroiliac rotation, although no fracture of the pubic bones could be made out.

L. was treated in the hospital from October 13, 1916, to April 14, 1917. He developed a curious malposition of his spine and neck which all of our efforts were unavailing to correct and we discharged him from the hospital because we were unable to do anything with him in the way of getting his co-operation to correct this posture defect.

He proved to be a most accomplished malingerer and was finally settled with on December 13, 1917, fourteen months after his original injury. On account of the element of malingering entering into this case, it is impossible to state what the amount of disability would have been but in all probability not more than six months.

Case 15—J. S., American, aged twenty-two, single, motor-helper, injured 2 a. m., October 31, 1916, by being caught between cars. Admitted to the hospital 3 a. m., on the same day.

Family and personal histories unimportant. Examination revealed fracture of the crest of the right ilium and radiograph revealed a linear fracture through the right ilium.

He remained in the hospital from October 31, 1916, to January 17, 1917, when he was discharged to out-patient treatment.

This man's injuries were compensated for August 29, 1917, and he left the district. He refused to return to work although able to do so within six months.

Case 16—J. M., Mexican, aged forty, married, injured 5 p. m., February 7, 1917, by a fall of rock which knocked him down a raise twenty-five feet, causing him to fall astride a grizzly. Admitted to the hospital 6 p. m., on the same day.

Family and personal histories unimportant. Examinations revealed multiple lacerations and contusions of both legs, abrasions lower third of outer surface of the right arm, fracture of the middle third of the right ulna, lacerated wound of scrotum with right testicle eviscerated, large hematoma of femoral and inguinal region right side, multiple fractures of the entire pelvic ring and rupture of the bladder—profound shock.

This patient died about 11:50 p. m., five hours after admission, without having rallied sufficiently to do anything for him.

Case 17—T. McK., American, aged thirty-seven, married, boilermaker, injured 10 a. m., April 2, 1917, by being struck by a falling telephone pole. Admitted to the hospital thirty minutes after the accident.

Family and personal histories negative. Examination revealed fracture of the pelvis, horizontal ramus of the pubis two and one-half inches from the symphysis, right side. He was discharged from the hospital May 4, 1917, to out-patient treatment.

This patient developed severe trouble with his left sacroiliac joint, probably due to a slight rotation of the joint forward; the radiogram being consistently negative. At six months he was walking without a cane, but was unable to climb hills on account of the involvement of the sacroiliac joint producing a weak back. It was estimated that his disability would continue for one year. His case was adjusted on October 27, 1917, and he left the district.

Case 18—B. H., American, aged forty-five, married, timberman, injured 3 p. m., April 28, 1917, by being struck by a motor train. Admitted to the hospital 4 p. m.

Family and personal histories negative. Examination revealed extensive crushing fractures of the pelvis and probably of the lumbar spine, lacerated wounds of the head, left shoulder, both hands and left leg.

He was in full shock and died at 5:50 p. m., one hour and fifteen minutes after admission.

Case 19—J. G., American, aged fifty-two, married, injured May 4, 1917, in an automobile wreck. Admitted to the hospital four hours after the accident.

Family and personal histories unimportant. Physical examination and radiographs resulted in a diagnosis of fracture of the horizontal and ascending rami of the left pubic bone, compound fracture of the left radius and fracture of the left tibia and fibula, two inches above the ankle joint.

He was removed to his home on May 17, 1917, and pursued a tedious convalescence on account of the fractures of the leg more than the fracture of the pelvis. He recovered, as far as the fracture of the pelvis was concerned, in about four months and was able to get about without inconvenience. Was disabled on account of the fractures of the leg for upwards of a year.

Case 20—T. E., American, aged forty-five, married, iron-worker, injured 11:45 p. m., October 10, 1917, by falling from a scaffold twenty-five feet, striking on rocks. Admitted to the hospital 12:10 a. m.

Family and personal histories unimportant. Examination revealed lacerations and contusions over the olecranon process of the right arm, contusion and abrasion lumbar region, and a fracture of the crest of the right ilium, confirmed by radiogram. This was a stellate fracture with lines running through the entire bone and reaching the margin of the acetabulum.

He was discharged from the hospital in ten days on crutches and was treated as an out-patient until the first of December, when he resumed work as a watchman in the mill and worked steadily until May 18, 1919, when his claim was adjusted. Time lost one month and twenty days.

Case 21—L. V., Mexican, aged twenty-eight, single, injured October 26, 1917, by being caught between a car and lumber stack. Admitted to the hospital 8:15 a. m., forty-five minutes after the accident.

Family and previous personal histories negative. Examination revealed a contusion over the crest of the ilium, posteriorly. The radiograph revealed a small fracture of the crest of the ilium, posteriorly, without much displacement.

He was discharged from the hospital November 6, 1917, and cleared for work November 18, 1917. Time lost, twenty-two days.

Case 22—L. L., American, aged twenty-two, single, air-haulage-helper, injured 3:30 p. m., December 11, 1917, by being caught between an air pipe, running along the wall of drift, and a moving motor car and was rolled along. Admitted to the hospital 4:30 p. m., the same day.

Family and previous personal histories negative. The diagnosis of fractured pelvis was confirmed by the radiogram, showing fracture of the ramus of the pubis with evidence of anterior rotation of the ilium on the right side.

This patient remained in the hospital from December 11th until February 21st, 1918, and was cleared for work on April 16, 1918. Time lost, four months and five days. Result, good.

Case 23—S. A., Mexican, aged twenty-two, married, laborer, injured January 4, 1919, at 4 p. m. Admitted to the hospital one hour later.

Personal and family histories negative. Examination and radiograph disclosed a fracture of the horizontal ramus of the pubis, left side, fracture and dislocation of left astragalus and fracture at the level of the ankle joint of the right fibula.

This patient pursued an uneventful course and was discharged from the hospital on March 22, 1919, to out-patient treatment. He

was compensated and cleared for work November 4, 1920. Total time lost, ten months.

Case 24—R. B., American, aged twenty-seven, married, motor helper, injured 12:15 a. m., January 30, 1919, by being caught between two cars. Admitted to the hospital 2:20 a. m., January 30, 1919.

Family and personal histories unimportant. On examination, diagnosis of fractured pelvis was made and confirmed by radiogram, locating a fracture in the left ischium with only moderate displacement.

This patient left the hospital in thirteen days on crutches to return to his home. His compensation was adjusted March 10, 1919, and he left the district.

Supplementary report on discharge indicated that this case was complicated by a neuritis of the sciatic nerve and the period of disability extended to six months.

Case 25—R. F., Mexican, aged thirty, married, timber helper, injured 2:30 a. m., August 8, 1919, by falling down a raise and landing astride a grizzley. Admitted to the hospital shortly after the accident.

Family and personal histories negative. Physical examination revealed a contused abrasion to the inner surface of the right thigh, contusion to perineum with hematoma. Radiograph revealed a fracture of the ascending ramus of the ischium on the right side.

He was discharged from the hospital September 26, 1919, walking. Compensated January 17, 1920, and returned to work soon after that. Total time lost, five months and eight days.

Case 26—J. K., Bohemian, aged thirty-eight, married, timberman, injured 6 p. m., October 5, 1919, by being struck across the back by a fall of rock. Admitted to the hospital 7 p. m., same day, in full shock.

Family and personal histories negative. Diagnosis of fracture of the pelvis evident from gross deformities. This patient did not rally from his shock and expired twenty hours after the accident, without a radiogram being possible. No autopsy held.

Case 27—F. U., Mexican, aged twenty-two, single, timber-helper, injured 6 a. m., December 1, 1919, by being struck by a car backing up in a drift and rolled along the track in front of the car. Admitted to the hospital 8 a. m., the same day.

Family and personal histories unimportant. Examination revealed a fracture of the right humerus, middle third, fracture of the left femur at the junction of the upper and middle thirds, severe contusion to the left shoulder, contusion and abrasion of the left thigh, and fracture of the crest of the ilium on the left side, were revealed by the radiograph.

He was discharged from the hospital March 15, 1920. Compensation adjusted May 8, 1920. He was cleared for work June 1, 1920. Time lost, six months.

Case 28—C. A., Greek, aged thirty-three, single, machineman, injured 4 p. m., June 11, 1920, by being in an automobile wreck. Admitted to the hospital 5:30 p. m., same day.

Family and previous personal histories negative. Examination revealed complete rupture of the membranous urethra. Radiogram revealed a comminuted fracture of the right ischium, fracture of the ramus of the right pubic bone with much splintering.

The proximal end of the urethra could not be located and it was necessary to open the bladder and to do a retrograde catheterization. The urethra was sutured over a catheter and, owing to the necessity of operative interference, the splintered fracture of the pubis was exposed and thus compounded.

This case healed without incident and on discharge, in thirty-two days, a number twenty-eight French sound could be passed without inconvenience. The fractures of the pubis and ischium had healed with a soft callus and he was walking with crutches comfortably.

This patient applied for permission to return to work in about three months from the date of his injury, walking without a limp and professing himself able to do full duty. It will be noted that this case did not come under the Compensation Act.

Case 29—J. H., American, aged thirty-six, married, crane-man, injured 2:30 a. m., November 28, 1920. Admitted to the hospital one hour later.

Family and personal histories negative. Diagnosis of Colle's fracture of the right forearm, laceration of the right jaw, abrasion right cheek and right chest and fracture of the ilium, right side, with quite considerable displacement, was made.

This patient pursued an uneventful course; was discharged from the hospital December 24, 1920; compensated in April and cleared for work in May, 1920, with no functional disability resulting from his fractured pelvis.

Case 30—J. B., American, aged thirty-four, married, steel worker, injured 4:25 p. m., December 16, 1920, by falling from a scaffold about fifty feet, landing in a pile of scrap iron. Admitted to the hospital at 4:45 p. m., the same day.

Family and previous personal histories negative. Examination revealed a fracture of the right femur about four inches below the neck, dislocation of the right shoulder, severe laceration of the right eye, and in the course of radiographing his right femur and hip joint an unsuspected fracture of the ramus of the right pubis was discovered.

He was discharged from the hospital March 22, 1921, and resumed light work on a farm about four weeks later, according to his statement.

Seen and examined September 5, 1921, walking with only a slight limp and able to resume his work any time. This patient never knew that he had a fractured pelvis. Loss of time, eight months fifteen days.

Case 31—M. G., Mexican, aged thirty-two, married, machine-man, injured 5:30 a. m., March 8, 1921, by being struck on the back by falling rock which knocked him down a raise twenty-five feet onto a grizzley. Admitted to the hospital 6:30 A. M., the same day.

Family and personal histories negative. Examination of the lower dorsal and sacroiliac regions revealed a complete fracture of both transverse processes of the first lumbar vertebra with slight outward and downward displacement. There was a suspicious transverse crack in the body of the third lumbar vertebra also an upward tilting of the left transverse process of the fourth lumbar vertebra, probably an incomplete fracture, otherwise the outline of the vertebral bodies appeared to be normal. Examination of the pelvis showed a comminuted fracture of the ramus of the right ischium; there was no marked displacement although there were several spicules of bone at the site of the fracture.

This patient remained in the hospital from March 8, 1921, to May 14, 1921, when he was discharged to out-patient care. His claim was adjusted June 15, 1921, but he did not return to work, leaving the district.

Our supplementary report states that the prognosis for restoration to complete working capacity as good and places the period of disability at eight months.

Case 32—P. P., Servian, aged twenty-seven, married, timberman, injured 3 p. m., July 7, 1921, by falling astride a grizzley while on his way out of the mine after completing his shift. Admitted to the hospital within thirty-five minutes.

Personal and family histories negative. Upon admission to the hospital he was bleeding profusely from a lacerated wound of the scrotum in the median line, also a hemorrhage from the urethra. A diagnosis of laceration of the urethra and lacerated wound of the scrotum was made and the patient treated accordingly.

The haemorrhage from the urethra cleared up without instrumentation in five days. The lacerated wound of the scrotum was sutured primarily and underwent some necrosis leaving a sloughed area about one-half cc long by one cc broad which healed without producing any deformity.

He was discharged from the hospital July 28, 1921. After his discharge to the outpatient department, this patient complained so much of pain on the left side around to the thigh in front that he was referred for x-ray and a comminuted, quite badly displaced fracture of the ascending ramus of the ischium on the left side was discovered.

The patient was not readmitted to the hospital but was fitted with a Storm binder which seems to give him some comfort and is encouraged to his dispensary care.

This patient is still under treatment with a probable disability of from seven to eight months.

FRACTURED VERTEBRAE*

WILLIAM B. BOWMAN, M. D., Los Angeles, California.

In presenting this paper before these joint societies, I wish to make a plea for a more careful and thorough examination for fractured vertebrae in back injuries, this type of trauma being a rather common one, and, I dare say, causes surgeons doing corporation or industrial accident work more trouble and worry than any other type of fracture.

Formerly, fractured vertebrae were thought to be comparatively rare and, when discovered, a very guarded prognosis was given. One well known author† states as follows: "The prognosis in all cases is unfavorable both as to recovery of function and as to great prolongation of life, becoming more serious in direct proportion to the higher situation of the fracture, the severity of the injury which causes it, and the amount of crushing or of dislocation."

Gurlt, in his table based on 52,000 fractures treated in the London Hospital, states that only .33% were fractured vertebrae. This, of course, was before the day of the roentgen ray and his figures in all probability are inaccurate, he having, no doubt, overlooked many compression fractures of the bodies and the transverse processes of

the various vertebrae which do not give definite symptoms and can only be diagnosed by a careful roentgen examination.

Since the advent of the Coolidge tube, intensifying screens, the Potter Bucky diaphragm, more powerful transformers, and other improvements, it is now possible to make a careful detailed examination of the entire spine in both the antero-posterior and lateral position, even in exceedingly heavy or muscular individuals, and it is surprising to find the number of cases of sprained backs, railroad spines, etc., that have actual lesions of the vertebrae.

Without stopping to comment on the type of fracture accompanied by paralysis and the classical text book symptoms, I will pass to the class commonly overlooked, which give rather indefinite symptoms and which can only be correctly diagnosed by the roentgen ray.

In a rather large series of back injuries which have been examined by me, most of which were industrial accident cases and were a direct result of a definite trauma, I was very much surprised to find a great many cases of fractured vertebrae. Most of them occurred in males, due in all probability to the fact that they were employed in

*Read before the joint meeting of the Medical & Surgical Association of the Southwest and The Pacific Coast Roentgen Ray Society, at Phoenix, Arizona, December 1-3, 1921.

more hazardous work and are more subject to injury than the opposite sex. Age did not seem to be a particular factor, although the majority occurred in patients over thirty-five years of age. The majority of these cases appeared for examination six months or longer after the injury, the patient, as a rule, having spent two or three months in bed and after a rest of several months was still unable to resume his regular duties.

The most common sites of fracture, according to frequency of occurrence, were the first lumbar, twelfth dorsal, second lumbar, eleventh dorsal, fifth lumbar and fifth and sixth cervical vertebrae. Fractures of other vertebrae were rarely encountered.

The most frequent type of injury was a compression fracture of the body, occasionally accompanied by a partial subluxation. In a few cases they were accompanied by a demonstrable fracture of the spinous processes or laminae and, personally, I feel that many more of them had fractures of the laminae which could not be demonstrated. Many fractures of the transverse processes were also encountered. A large number were accompanied by other fractures. In fact, I am of the opinion that the reason a great many of these back injuries were unrecognized was due to the fact that the symptoms from other fractured bones were more acute and caused the attending surgeon to overlook them.

ETIOLOGY

The etiology in practically all of the cases of fractured vertebrae was a definite injury, although some fractures of the transverse processes were due to muscular violence and one case of a fractured fifth lumbar was due to the same cause. Two cases of fractured cervical vertebrae, one of which was accompanied by a partial subluxation of the body, were due to striking the head on the bottom of a tank and stream while diving. Several of the cases were the result of falls from various heights while doing construction work. Syphilis may be a predisposing cause, as sev-

eral of these patients had a positive blood Wasserman.

SYMPTOMS

The chief symptom was pain, either in the region of the injury, in the parts supplied by the spinal nerves involved or in many cases in the lumbo-sacral or sacroiliac regions. This latter symptom appeared rather late and was probably due to faulty posture. Practically all of the patients complained of so-called weak backs and the inability to resume their regular line of work.

DIAGNOSIS

The diagnosis depends upon getting clear detailed roentgenograms of all of the suspected vertebrae in both the antero-posterior and lateral positions. Stereoscopic roentgenograms may be of assistance, particularly in the sacro-iliac region, but do not give nearly as much information as do two roentgenograms made at right angles to each other. In most of the compression fractures it is impossible to demonstrate a fracture line, but the lateral roentgenogram shows a definite wedge-shaped vertebra, the amount of deformity depending upon the degree of compression. These fractures often have to be differentiated from tuberculosis, carcinoma, syphilis, infectious diseases of the spine such as spondylitis deformans, etc., and congenital anomalies.

DIFFERENTIAL DIAGNOSIS

The history in making a differential diagnosis is most important. In tuberculosis there is bone destruction without proliferation or callus formation and the patient usually has fever. In carcinoma there is bone destruction without proliferation, the pain is usually severe and, most important of all, the patient will have a primary lesion in some other part of the body. In syphilitic spondylitis with caries, the pain is usually worse at night, new bone formation is more marked than in fractures, the periosteum is greatly thickened and the symptoms are not as se-

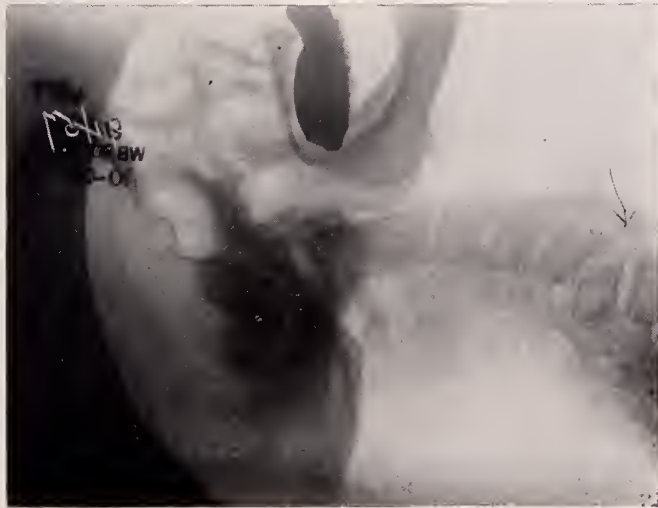


FIG. 1

Figs. 1 and 2

Case 9457, H. P. J., from Dr. P. W. Seals (S. C. I. F.)

Injured March 21, 1920; examined Oct. 22, 1920.

History: Knocked off a "road grader" falling on head. Neck and shoulder stiff.

Diagnosis: Fracture of spinous process of fifth cervical, and dislocation of upper five cervical vertebrae.

Article on Fractured Vertebrae



FIG. 2

Fig. 3

Case 6025, J. B., patient of Dr. Ellis Jones, (S. C. I. F.)

Injured July 29, 1918; examined July 3, 1919.

History: Fell about 30 feet.

Diagnosis: Compression fracture of first lumbar vertebra.



FIG. 3



FIG. 4

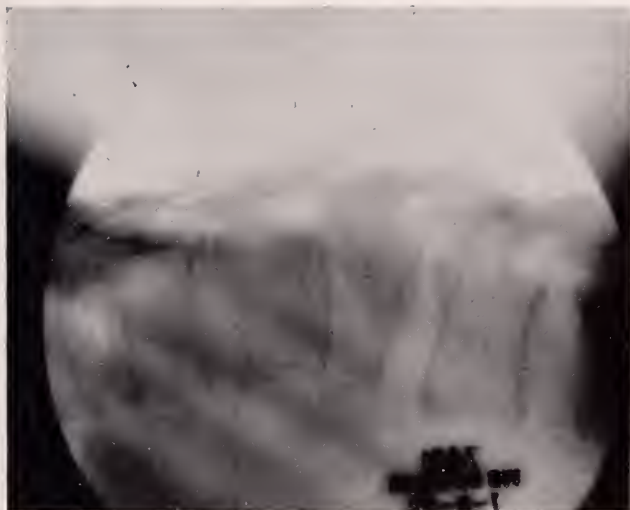


FIG. 5

Figs. 4 and 5

Case 7431, W. L., Dr. Ellis Jones (S. C. I. F.)

Injured June 7th, 1919; examined June 9, 1920.

History: Fell 30 feet.

Diagnosis: Compression fracture of second lumbar vertebra.

vere as would be expected from the extent of the lesion. In spondylitis deformans the bodies are asymmetrical and the lesion is seldom confined to one vertebra. There are chronic hypertrophic changes present on the corners of the bodies, which later fuse and unite. In congenital anomalies failure of fusion of the laminae is sometimes mistaken for a fracture, as is failure of fusion of the transverse processes. The presence of an extra ossific center or the absence of one, particularly in the dorsal region, is a rather common congenital anomaly which may be mistaken for a fracture.

TECHNIQUE

If there is any doubt about the region involved, a large 14x17 roentgenogram of the spine should be made and examined for the presence and location of a lesion. If present, the affected area should then be examined and roentgenograms made in every conceivable position. An attempt to economize in the use of plates or films would probably result in many lesions being overlooked.

Roentgenograms should be made in both directions, well beyond the region of the injury. In trauma of the lower portion of the spine, it is essential to include the dorso-lumbar junction as this region appears to be a favorite site of fracture.

Personally, I believe in all severe injuries when there is a possibility that

the back has been hurt, it is advisable to take at least one large roentgenogram of the spine. This would prevent the overlooking of a fracture, save the patient considerable trouble, and prevent much malingering and unnecessary expense to the insured.

It is necessary that all roentgenograms contain as much detail as possible. The lateral view will oftentimes reveal a lesion when the antero-posterior view appears to be negative. Stereoscopic roentgenograms should be taken when additional information is desired.

The use of duplitized films with double intensifying screens will greatly assist in shortening the time of exposure, furnish greater detail in heavy parts and, if used in conjunction with the Potter Bucky diaphragm, will enable the roentgenologist to obtain clear detail in regions which have heretofore been unattainable.

SUMMARY AND CONCLUSIONS

1. Careful roentgen studies of injured spines show fractured vertebrae to be present more frequently than was formerly supposed.
2. Many cases of weak backs, railroad spines, supposed malignancy, etc., have actual lesions of the vertebrae.
3. All severe body injuries should have at least one roentgenogram made of the spine to avoid the possibility of overlooking a fractured vertebra.

†American Textbook of Surgery.

SOME OCULAR MANIFESTATIONS OF TUBERCULOSIS*

DR. H. H. STARK, *El Paso, Texas.*

Under ordinary circumstances a paper on a special subject such as this should be prefaced with an apology, but owing to the fact that in tuberculosis of the eye the pathological process is under direct observation which gives us the advantage of a closer study than when tuberculosis is found in other parts of the body, and because of its bearing on the disease generally, I feel warranted in reading this paper before a meeting of physicians in different lines of medical work.

The subject is best approached by accepting the statement of the specialist on tuberculosis, that 98 per cent of the civilized race are infected with it sometime between the ages of two and eighteen years. The result of the infection may be that the patient succumbs to the disease. However, in the majority of cases there are spontaneous cures, better classified as clinical cures, which condition represents all stages of the latent disease from imperfectly healed lesions to a complete sterilization of the individual for tubercle bacilli, with an immunity lasting through the balance of his life.

The process of spontaneous cure is undoubtedly due to the development of tissue resistance, together with the forming of antibodies in sufficient quantity to overcome the bacillary invasion. The antibodies also stimulate the formation of a fibrin exudate around the lesion, which subsequently shrinks and encapsulates the area, thus limiting its activity. This infected area may remain latent as occult tuberculosis and probably does in the majority of people. In other cases, due to disease, mental or physical strain, or any cause that lowers the natural resistance of the body, the area may again become active, breaking down the protecting fibrin

capsule, with a possibility of erosion into the circulatory system, with preference for the veins because of the thinness of their coats. When this occurs, the bacilli may be lodged at any point, but especially where the lumen of the vessel is small.

Just when an individual is free from occult tuberculosis is difficult to say. Experience has taught us that the dermal and subcutaneous tests with old tuberculin may give us a reaction in a large percentage of healthy adults, indicating there still exists in the blood tuberculous antibodies. We know that artificial immunity through the injection of an antigen is only passive, therefore we feel these antibodies must have been recently stimulated by a latent tuberculous activity. Reasoning thus, we can safely say that physical and x-ray examination of the chest exclude only the pronounced type of activity, and that we have present in many instances tuberculous foci which cannot be demonstrated by ordinary methods.

In the involvement of the eye, therefore, we are dealing either with a toxemia, or with a transmitted infection. The conditions that encourage the trouble are the same here as in other parts of the body—that is, injury, strain, both local and general infections, or any cause that reduces its resistance. These conditions of the eye may be divided into two classes—those occurring in latent or occult tuberculosis, and those of active tuberculosis. The occult tuberculosis may be divided into three stages depending upon the length of time the individual has been infected, being similar in character to syphilis, and may be classified in the same way—that is, primary, secondary and tertiary. There is no sharp line of demarkation between the three stages as certain conditions,

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especially those due to toxemia, may be found in all of them. However, each has a predominance of one type of disease.

PRIMARY STAGE

This stage represents the period of early life during which the individual is going through the development of immunity, and the predominating condition is the result of toxemia manifesting itself in the form of a keratoconjunctivitis. The symptoms are phlyctenular ulcers of the cornea and corneoscleral margin, intense photophobia, while physically there may be enlarged lymphatic glands, nasal discharge, eczema, general lowering of weight, slight rise of temperature, with lack of development of the child.

There is nothing new in these symptoms, as they were reported as early as 1836, by Mackenzie, who ascribed them to scrofula, while in later years the Germans classify them as eczematous, owing to the frequency with which this disease was found in connection with the eye trouble. The result of the disease is one of long continued irritation of the eyes with frequent relapses after apparent cure. There is formed scar tissue at the site of the ulcer, producing an irregular astigmatism, which may last the entire life of the individual.

It is true that some may take exception to the statement that these cases are tuberculous, for it has been claimed by certain authors of authority that they are either due to general toxemia from the intestinal tract, dietetic irregularities, or focal infection from the nasal sinuses or tonsils, basing their conclusions on the fact that improvement results from the treatment of these conditions.

For a number of years, I have considered the cases tuberculous, basing my opinion on the results of cutaneous tuberculin tests, which are most frequently positive and occasionally give a focal reaction in the diseased eye, and on the results secured by subcutaneous administration of old tuberculin, which also produce a focal reaction in the dis-

eased organ. When this treatment is continued, with gradually increasing doses, the improvement both in eyes and physical condition has been so gratifying, even where the intestinal tract, diet and focal infected areas have received no attention, that I am convinced the condition is tuberculous.

It is true that any toxemia, whether general or focal, has a bearing on the disease, as it is seldom found in the better nourished, healthy child. We know that antibodies are present, indicated by a positive dermal test, but undoubtedly there is something in the additional antigen of other bacteria, which either prevents the formation of sufficient antibodies to overcome the disease, or uses up the available complement, thus interfering with the natural process of healing. Therefore, rather than combat the antigens stimulated from an unknown source, I believe in building up the tuberculous antibodies to such an extent that they may overcome this infection and allow the others to recover spontaneously.

Another symptom of tuberculosis which occurs in the eye of the apparently healthy child is that of a silvery white reflex in the retina and along the retinal vessels, at times so dense that it takes a careful examination to disclose the fact that it is not an exudate. The nerve head may be slightly blurred, the eyes irritated by light, and all the symptoms of eye strain manifesting itself, particularly in the afternoon during school days, even where there is no error of refraction. These conditions are frequently found in children slightly below par, who improve rapidly following the administration of minute doses of tuberculin.

During the age of childhood also occur those cases of tuberculous meningitis, in which numerous tubercles of the choroid develop even within a few hours.

SECOND STAGE

This is the stage of adult life, which, roughly stated, is between 20 and 50 years. During those years there devel-

ops a deeper invasion, manifesting itself as scleritis, iritis, iridocyclitis, and retinitis, the latter often of a hemorrhagic nature. In the majority of these cases, there is no sign of general tuberculosis on physical and x-ray examination. However, they may show a temperature curve of two degrees or more during the twenty-four hours, usually markedly subnormal in the morning. The diagnosis is made by subcutaneous injection of old tuberculin, the size of the dose depending on the condition of the patient. In positive cases we have a general reaction, indicated by a rise in temperature of one or more degrees in forty-eight hours; a local reaction at the site of the injection indicated by redness at this spot, and a focal reaction on which the diagnosis of localized tuberculosis is made, at the site of the lesion, indicated by an increased activity in this area.

Only a comparatively few years ago, it was thought best to enucleate tuberculous eyes, but at the present time they are treated with repeated small doses of tuberculin for several months, just below or up to the stage of slight reaction, which usually results in the cessation of the activity. In these cases especially, we have constantly under our observation the same process of healing that takes place in other parts of the body—that is, the decrease in activity, organization, and shrinking of the exudate into a dense fibrin.

THIRD STAGE

This stage is from fifty years upward, during which the condition is more often one of less virulence, due to there having been developed a greater tissue resistance to the toxin and possibly an attenuation of the micro-organism. It is disposed to manifest itself as a localized iridocyclitis, with fine deposits on the posterior corneal surface, which may remain for years, even where there is no sign of activity. There frequently occurs an opacity of the lens resulting in a complete cataract, and often a change in the color of the iris. The diagnosis is also made by subcu-

taneous injection of old tuberculin, which, if positive, produces the three reactions previously described.

ACTIVE TUBERCULOSIS

The eye conditions depend on the stage of the disease, but most of the symptoms are usually those of toxemia, as there is seldom found the pathology common to the secondary or tertiary stages of occult tuberculosis. The most frequent symptoms are headache, photophobia, eyes easily tired due to weak accommodation and interference with the action of the extrinsic muscles, more aggravated where there is an error of refraction. The headaches persist even when the eyes are put completely to rest by a cycloplegic and are not always relieved by correcting lens. Examination shows a condition similar to that found in childhood; that is, marked congestion of the retina, silvery reflex along the vessels, with slight blurring of the disc, which may have a very thin white exudate covering it. Both pupils are frequently larger than normal and occasionally there is found one pupil widely dilated, with no reaction to either light or accommodation, due perhaps to interference with the sympathetic nervous system on the side affected.

It is not infrequent that we find cases who have had repeated examination of the eyes and fitting of glasses, with no improvement in the condition. Many of them give a history of delicate childhood, nervous adult life, and irritable temper—symptoms indicating a more than ordinary difficulty on the part of the individual in overcoming the primary invasion of tuberculosis and developing an immunity. Examination of these cases in many instances showed old, apparently healed lesions of the lungs, and at times slightly active areas, which had never before been suspected.

CONCLUSIONS

Our lesson from the primary stage of occult tuberculosis should be that all children have this infection, which is

seldom treated, and that it may complicate any intercurrent disease or condition of the body.

The secondary stage teaches us that any region of the body is subject to an endogenous infection of tuberculosis from previously healed lesions, even in apparently healthy individuals.

The tertiary stage teaches that even in late life the individual is not free from the possibility of localized tuberculosis, even though of a milder type.

The active stage teaches us that many cases, with symptoms of eye strain and neurasthenia, should have more than ordinary physical examination to exclude tuberculosis—that we should stop

visualizing tuberculosis as an activity of the lungs, demonstrated by the usual physical examination, and visualize it as a focal infection, which, under favorable circumstances, is self-limited, but ready to become active again at the site of the original lesion, producing symptoms due to toxemia, or distributing the infection to any part of the body.

The general pathology may be applied to any organ or tissue of the body. Therefore, I would ask the physicians in their different lines of medical work to apply to their branch of medicine the experience of the oculist in hopes of relieving by medication conditions previously thought to be only surgical.

ABSORPTION AND ELIMINATION OF WATER IN RELATION TO ABDOMINAL SURGERY*

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Of necessity, there is a marked change in the absorption and elimination of water when the abdomen is opened, for whatever cause. A great number of practices, commonly called technique, have arisen to overcome, temporarily, an abnormal condition of water absorption. Seldom have these practices been based either upon careful analysis, or application of the normal and abnormal physiological functions of the body, or upon knowledge of the principles of experimental physiological chemistry.

Admit, as a basis for this argument, that the average well man is in a state of physiological balance; that he evacuates his bowel, and excretes about 1200cc, or forty ounces, of urine daily, and that furthermore, when we pronounce him cured, he is returned to his state of physiological balance. Then, if this is a true statement, why should an operative case be tormented by thirst,

distended with gas, punished by reverse peristalsis, or impaired as to kidney function, when our most scientific research students, physiologists, chemists and clinicians have suggested a more intelligent course to pursue?

The advantages of abstinence of water by mouth, prior to a laparotomy are evident. No one wants an operation delayed by ejections of water from the mouth during anesthesia. Incidentally, it is dangerous. In ten years not one case of emergency surgery for obstruction has come to my attention that did not have at least two quarts of fluid in the upper intestinal tract, above the obstruction. It is interesting to note how much fluid there is in these obstructed cases, and how intensely thirsty they are. A dry tongue and an incessant demand for more water is most characteristic.

*Read before The Arizona State Medical Association, at Tucson, Arizona, April 16, 1921.

To alleviate such a water-logged condition we discontinue water in order to prevent vomiting, and syphon the stomach, in obstruction, to prevent drowning.

Cannon, Professor of Physiology at Harvard, as early as 1898, gave the matter of peristalsis of the intestines much study, and elucidated this obscure mechanism of peristalsis by experiments on animals, the result of which he published in several articles in the *Journal of the American Medical Association*, and the *American Journal of Physiology* from 1899 until 1904.

For our purposes, it is well to know that water does not run through the intestinal tube as through a pipe, but is forced along by a very complex neuromuscular mechanism. When the parietal peritoneum is severed, and an injury done to the gut, this complex nervous force, commonly called peristalsis, is reversed and remains so for at least eighteen hours, and in some individuals for four days. We have all seen cases in which the normal peristalsis did not return until later, partially due to the nature of the operation and largely due to persistent efforts, sometimes brutal, to overcome the reverse wave, rather than take advantage of it.

Alvarez, of the Hooper Foundation, University of California, amplified Cannon's work. He established a neuromuscular gradient showing how this delicate and painless wave propagated itself along the bowel. He further demonstrated the ease by which peristalsis is paralyzed by salts, allowing a distention of the bowel by paralysis. He showed that reversal of peristalsis followed upon mutilation or obstruction. Finally he proved that the bowel became hypertrophied from vigorous peristalsis due to partial obstruction.

Out of a mass of experiment and clinical experience, there have been accepted these facts: That water absorption takes place in the ascending and transverse colon, and that the peristaltic wave is reversed after injury for at least eighteen hours.

Provided the careful surgeon has prepared his patient at least twelve

hours beforehand, we know of eighteen hours more during which dehydration will continue under average conditions. If there is an attempt to force fluids during this period the condition is generally stimulated, or clinically aggravated, and dehydration will continue over a longer period.

We have known for some time that emergency cases—the unprepared cases—progress better than the so-called prepared one. The dehydration in the emergency case is ordinarily just half that of the case which has been prepared. Inasmuch as the three vital functions of the body remain unimpaired, the heart, lungs and kidneys, by invasion of the abdominal cavity, it is paramount that the function of these organs remain undisturbed.

A number of vicious practices—vicious so far as the physiology of the previously mentioned organs are concerned—have been in general use as “technique” for the past twenty years.

This period might be called the age of purgatives. Salts are particularly bad. Some seventeen years ago, Sir Berkley Monihan wrote a little couplet on the effects of purgation. He said:

“Perforation means purgation of
the appendix, kinked and bad,

Food and drink annoy him and
aperients drive him mad.”

Ochsner brought forth his paper on physiological rest at about this same time. Distention of the intestines from paralysis will follow the administration of salts in a normal individual. In tests in physiological chemistry, salts will produce a complete separation of the serum globulin and albumen. Following upon this fact, diphtheria antitoxin was refined. After nineteen years of surgery, I have never encountered formed material proximal to the ileocecal valve. The self-evident fact remains that all formed stool, and the entire area of water absorption can be reached by an enema. Enemata, however given, reach the cecum in about twenty seconds, or less. Roentgenolo-

gists have found that they could not deliver an enema, and place a plate to take a picture, without locating the head of the barium column at the ileo-coecal valve.

The too early administration of water by mouth, vomiting, and the use of milk in the postoperative diet of laparotomies, are additional factors in the production of gaseous distention of the abdomen. This paresis of the bowel is coincident with the failure of water elimination through faulty peristalsis. Prolonged etherization adds to the dehydration of the patient. Very few surgeons fail to use the Murphy drip postoperatively. Why they do not begin it preoperatively is hard to explain, unless the operation is designed for the colon. Many of the fatty acids are ether-soluble, and a mild acidosis may follow any etherization. This is more pronounced, and frequently fatal, in diabetes.

The point not to be forgotten is that you most probably will "get by," but if you have not protected your patient against the effects of dehydration you may expect kidney insufficiency to follow. The delicate capsule about the glomerulus of the kidney is very susceptible to the effects of toxin, bacterial or nitrogenous waste. Once impaired, this effect seems to be lasting.

The necessity for the maintenance of absorption and elimination sufficient to protect the tissues in their chemical equilibrium and vital resistance to bacterial invasion, is undisputed.

Murphy appreciated keenly this necessity, when he added to the Fowler position the Murphy drip. Had he never operated upon a patient, by means of this one contribution to surgery alone, he has saved more lives and prevented more serious complications than any other man. Deaver used an interrupted method of proctoclysis about the time Murphy advocated his drip. It is a very satisfactory method where an irritable sphincter or spastic colon are encountered. Eight ounces of physiological salt solution injected every three hours, omitting the three a. m. treatment, introduces fifty-five ounces. From

this amount forty-four ounces of urine have been recovered in twenty-four hours. This amount of urine is about the normal estimated by physiological chemists.

Intravenous administrations of water, glucose, mucilage of acacia, and soda are not within the scope of this paper. I condemn all intravenous usage as too rapid of absorption and elimination, and possibly too great a strain upon the actual mechanics of the cardio-vascular mechanism. Subcutaneous absorption of water is most excellent. If carefully given, it is painless. If the 1200cc of normal excretion for twenty-four hours is allowed three hours for absorption, the patient will not complain either of the administration, or of thirst. A hospital that cannot produce a hypodermoclysis outfit ready for use in ten minutes is not properly equipped.

A colleague of mine said that it was a very comforting thing for him to know that after an operation there was a little urine in the bladder. He felt that vomiting, distention, and painful peristalsis were practically things of the past. This is true. These sequellae do not occur when the average physiological balance is maintained.

No surgeon advises the immediate use of a broken leg, but many surgeons attempt the immediate restoration of function of the gastrointestinal tract. My imagination does not carry me so far as to believe that more than a very delicate plastic exudate can be formed about a resected stomach in five days. When can you feed your patient? That will depend upon circumstances. This I can assure you, when the patient experiences a normal return of peristalsis, then you can generally feed him, with impunity, and anything he can chew up, except milk.

I continued a water starvation fifty-two days in a pellagra patient. Many unsuccessful attempts were made during this period to coax an irritable stomach to retain food. The fast of Mc-

Sweeney lasted seventy-two days. I mention these extreme periods in order to help control a hysterical desire on the part of the doctor to feed his patient. Are the patients thirsty? No, not when the tongue is kept moist by the introduction of sufficient water beneath the skin, or per rectum whenever possible.

Can too much water be introduced? Yes. On two occasions I have seen anuria, and possible dilatation of the

heart follow. A good rule to follow is the physiological index. A moist tongue, and 1000cc excretion daily. When this is accomplished remember you are only to return your patient to a state of physiological balance, not to make a super-irrigator of him.

By following an application of anatomical and physiological principles, with an average appreciation of the patient, surgery of the abdomen will be robbed of many of its terrors.

THE PROGNOSIS IN PULMONARY TUBERCULOSIS*

DR. J. E. J. HARRIS, Albuquerque, N. M.

The diagnosis of tuberculosis having been made, the first question, and, to the patient the most important one, is: "What are the chances for my recovery?"

The various possibilities in prognosis cover a wide field and range from early death through a number of intermediary results to complete cure, that is, elimination of all tubercle bacilli from the body and restoration to normal of the pulmonary tissues. However, as clinicians we are less interested in a "cure" in its technical sense, and more interested in the "recovery" of the patient, by which term we mean a return to usefulness and wage-earning capacity. This is the practical application of prognosis from the standpoint of common sense.

Close study of the individual and the disease will enable us to make a favorable prognosis when the probability exists that the patient will be restored either to his former activity and use-

fulness or can look forward to a condition permitting some wage-earning capacity in a different sphere of activity.

Inasmuch as the only certain thing about tuberculosis is its uncertainty, and the unexpected often happens, the prognosis must necessarily be guarded at all times. It is always advisable to defer a prognosis until the patient has been under observation for at least a month, during which time his response to treatment can be noted.

In weighing the prognosis, since the final outcome depends on the patient's resistance and on the number and virulence of the infecting bacilli, we must estimate the combined influence of the factors relating (1) to the individual, and (2) to the disease.

The more prominent factors relating to the individual are intelligence, age, sex, race, heredity, environment, character and disposition, occupation, and financial condition.

*Read before the 39th Annual Meeting of The New Mexico Medical Society, Albuquerque, April 29-30, 1921. (The title of this paper appeared in the December 1921 issue, but the paper was omitted through an error not detected in time to correct.)

INTELLIGENCE. I have purposely placed the factor of intelligence first. It is an axiom in the study of tuberculosis that a patient's chances for recovery depend more on what he carries above the collar than on what he has below. The physician is warranted in making a more favorable prognosis in the case of the intelligent patient who appreciates the nature of the disease and co-operates with his physician in carrying out the latter's instructions.

AGE. Acute tuberculosis is more common in children up to the age of eight, and this is probably the most serious period. It is toward the end of this period that the child begins to show increased resistance and tendency to chronicity of the disease. Many observers hold that the prognosis is poor between the ages of fifteen and twenty-one because during this period the patient lacks discretion and judgment. From twenty-one to about fifty the prognosis improves.

SEX. Sex exerts slight influence in prognosis, although my experience has been that the prognosis in women is somewhat better than in men. The female is usually more amenable to an enforced regime and, with our accepted mode of treatment, the change from a previous indoor existence to an outdoor one is more marked. After a definite diagnosis has been made the female is more apt to avail herself of facilities for treatment than the male, since the male, being the wage-earner, is often compelled to delay treatment until his condition is advanced. Under the heading of sex we may consider pregnancy, which is a complication of very unfavorable prognostic import. The extra burden during gestation, and the strain incident to delivery are almost certain to increase the activity of the tuberculous process.

RACE. The prognostic significance of race is due to the fact that certain races, like the American Indian and the Negro, have almost no resistance to tuberculosis, and the Irish and Swedish very little, while the Jews and, to a lesser extent, the Italians, have developed an increased resistance. As in

many other factors, it is, however, unwise to generalize regarding the factor of race in the prognosis of the individual cases as I have seen Negroes and Indians who have made good recoveries.

HEREDITY. Although we know now that tuberculosis is not an inherited disease, it was formerly thought that heredity played an important part in prognosis. Many hold the opinion that individual susceptibility to tuberculosis is inherited and point to certain families where the disease has run an acute course, and to others where the disease runs a chronic course, terminating in recovery. Other observers (Riebmayr and King) believe that the children of tuberculous parents have increased resistance to the disease. The probability is that the child of tuberculous parents inherits at birth neither a tendency to tuberculosis *per se*, nor an increased resistance to the disease, but in all probability inherits a weak constitution, which in a poor environment makes the child less resistant to any infection.

ENVIRONMENT. Environment is an important factor in prognosis. This is especially true as regards continued health after an arrest has been made. The patient who makes a change from the conditions at home or those connected with his occupation or mode of life which bred the disease in the first place to the regime found in well-ordered sanatoria, usually some distance from home, has a more favorable prognosis than the patient who, for various reasons, finds it necessary to take the "cure" at home under unfavorable conditions. The more favorable prognosis is due to the radical change in the mode of living, and to intelligent supervision. Away from home the physician does not have to contend with the influence of well-meaning but misguided friends and relatives. As a rule, patients from the country do not do so well as patients from the city; neither do outdoor workers do as well as those whose occupation has kept them indoors.

CHARACTER AND DISPOSITION. Since the element of time necessary in making an arrest draws largely on the patience of the patient, it follows that the cheerful, optimistic, phlegmatic type of patient who is actively co-operating with his physician has a better chance for recovery than the nervous, irritable patient who is impatient of results and seeks short cuts to recovery by the aid of various nostrums.

OCCUPATION. In considering occupation as a prognostic factor we find that, as before stated, farmers and outdoor workers show less tendency to recover than do those whose occupation has been confining in poorly ventilated offices and factories, as the outdoor treatment offers less marked change to the outdoor worker than to the factory employee. However, with the exception of such occupations as those followed by stone-cutters, grinders, zinc and other metal workers, miners, millers, and others where the inhalation of fine dust particles leads to a chronic inflammatory condition of the lungs offering fertile soil for the development of the tubercle bacillus, occupation in itself is less often a causal factor than the environment and habits of the patient. For this reason, having taught the patient how to take care of the other sixteen hours a day, the prognosis is better in regard to a continuation of his arrest when we return him to his former occupation, excluding a few specially dangerous ones, than it is when we advise him to seek a new occupation. The usual advice to the case showing little or no activity is to "get a light, outdoor job." All the light outdoor jobs were taken long ago. Further, light work means light pay; light pay means insufficient food and shelter; and this vicious circle usually means relapse. The patient can usually earn more money for work to which he has become accustomed.

FINANCIAL CONDITION. Patients with ample means receive a better prognosis as they are better able to meet the prolonged period of invalidism under proper hygienic surroundings.

FACTORS RELATING TO THE DISEASE. The most important are the history of the present illness, the physical signs, and symptoms, and the complications.

Since about 90% of early cases of pulmonary tuberculosis recover with proper treatment, while about 50% of moderately advanced and 10% of advanced cases result in an arrest of the disease, the prognostic importance of an early diagnosis is apparent. For this reason a sudden onset is usually more favorable because the patient consults the physician at once. An initial hemorrhage is usually a visual demonstration to the patient that something is wrong, and he immediately seeks medical advice, instead of waiting until pronounced symptoms are present and the disease advanced.

As the local lesion rarely makes progress in the absence of fever, elevation of temperature is thus an important sign, especially if it does not respond to absolute bed rest. High fever with marked remissions, the so-called septic type, usually means cavity formation and advanced disease. The inverted type, high in the morning and lower in the afternoon and evening, usually means progressive disease or a new focus.

A pulse rate that is constantly over 110 indicates a poor prognosis. Lawra-son Brown calls the digestion the "key-note of the prognostic arch. As long as it remains good, and patient can take sufficient nourishment, there is hope. If it fails, the outlook is indeed gloomy."

Physical signs indicate the nature of tuberculous process and the area involved. They tell what injury has already occurred, but give very little information in regard to activity or arrest of the tuberculous process. For this reason physical signs are of less prognostic significance than constitutional symptoms. Many patients with extensive involvement but slight constitutional disturbance secure an arrest of

the process, while others with slight involvement succumb, where the symptoms indicate an extremely active process. Where the disease is limited to an apex or to the apices, the prognosis is more favorable than it is where there is infiltration scattered over one or two lobes. The finer the rale, the better the prognosis. In this connection it is well to remember that we need not wait for the absolute disappearance of rales before returning the patients to work, as apical rales may persist long after all symptoms have disappeared.

The prognosis is less favorable in those cases which present tubercle bacilli in the sputum, as the presence of tubercle bacilli always indicates ulceration.

Complications may be tuberculous or non-tuberculous, but the occurrence of any complication is of unfavorable prognostic import. Tuberculous laryngitis makes the prognosis grave. In tuberculous meningitis the prognosis is practically hopeless. Tuberculous enteritis, interfering as it does with digestion and assimilation, is a complication of very

grave significance. Pleurisy with effusion may sometimes help by resting the affected lung, but often interferes with the return flow of the blood and produces venous congestion.

Chief among the non-tuberculous complications which affect prognosis in women is pregnancy, as the extra burden during gestation and the strain of delivery are pretty certain to bring about increased activity.

Family cares and misguided friends are often complications which affect prognosis unfavorably.

In conclusion, prognosis is always uncertain, and should be deferred until the patient has been under observation for at least a month. Symptoms are of more value than physical signs. The most important are those which refer to the digestive apparatus, and disturbances of fever and pulse. The intelligence, financial condition, and environment are important factors. Other factors, such as age, sex, race, heredity, mode of onset, etc., are helpful only as they concur with the symptoms and physical signs.

PSYCHO-NEUROSIS, INCIDENT TO WAR EXPERIENCE

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Two striking features stand out in the study of economical losses, incident to great national and international catastrophes, when we study their effects upon the human mechanism. These are physio-economical and psycho-economical.

While these two pathological conditions may exist independently, they may be, and frequently are, combined in every conceivable degree of relation. Those who have had occasion to study these conditions incident to minor and localized catastrophes, where human energies have been jeopardized, have seen in the aftermath of accidents, some of the smaller effects on mind and body. Is it any wonder that such a delicate mechanism as the human being should be greatly influenced, or that the physical body should suffer impairment of function, that reason should topple from its throne, when wrecks, explosions, accidents and undreamed of incidents, combined with exposures and strange adventures, are multiplied by daily experience in the life of a young, untraveled, inexperienced person, during such terrible experiences as are incident to a great war.

The making of a soldier out of a citizen is a complex and comprehensive procedure. During the period of his training, he must be changed from a civilized citizen into a savage soldier. From his earliest comprehension he has been taught the commandment, "Thou shalt not kill," and now he is instructed in the art and science of killing. He has been taught from early childhood that lives must be governed by law and order and that differences should be settled by conference and compromise. Now all the books of law and justice must be swept aside and with bayonet, rifle, and high explosives, he is to annihilate the other sons of Adam, who think differently from him and his clan.

I have heard an experienced army officer say that it took three years to make a soldier out of a raw recruit, one-half the time nature is supposed to make the complete atomic and metabolic cycle of animal regeneration. The house not built with hands, must be torn down and another structure of different physical requirement and mental attitude constructed for the exigencies of the occasion.

When these things are carefully considered it will not be surprising that man cannot turn the sword again into the plowshare with alacrity and ease, for, though the mind may be willing, the body is often weak, or the converse condition.

The physical ills of the un-regenerated soldier are usually apparent. If they consist of the loss of a limb, a member or a sense, it does not require a specialist to determine the degree of his disability. But when it comes to determining the metabolic, endocrinous, atomic, vibratory, psychologic and psychotic changes incident to war, the wisdom of Solomon re-incarnated is little better than that of babes and sucklings.

Regardless of whether brain functions are due to the activities of dendrites, the movement of neuroglia, or the functioning of synapses, we know that the paths of conduction in the brain may be blocked or freed by agencies, mental and physical, and that shifting and changed relations are continually taking place in the activities of life. There probably are, in the variable atomic relations, breakable points or areas of variable resistance from whence comes our hysterias, psycho-neuroses, neurasthenias, and psychasthenias; breaks in the correlation of the atomic elements of the neuronic organization and an interference with their synchronous vibrations. In the language

of Charles L. Dana, "When a person has great emotional shock and there follow tremors, speech defects, paralysis, or anesthetics, it may well be because the synapses of certain groups of neurons functionally selected are blocked by the torrent of impulses aroused by fright or pain, combined with the excess of epinephrine or other toxic material thrown into the blood."

Previous to the development of psychoneurosis there always is acquired or congenital instability of the nerve centers, making a possible interruption of normal function.

Crile states that, "An analysis of the phenomena of fear shows that, as far as can be determined, all of the bodily functions which are of no direct assistance in the effort toward self-preservation, are suspended," and the same can be said of worry, anger, and pain.

Brill has, fancifully, called psychoneuroses "the step-children of medicine," I presume because of their general neglect.

Brewer and Freud, in 1895, found that hysterics, neuralgias, and paralysis could be traced to actual psychic traumata.

All of the above statements and conclusions are only brought forward to prove an axiom, to-wit: The human brain can and does undergo psychoneurotic changes dependent upon physical derangements incident to war. Being a physicist, I believe every phenomenon of nature has a physical explanation. I can understand, in certain vibratory conditions, how the cell construction of a human being can be easily changed by surrounding and external forces incident to war.

We have brought back from France and England an army of changed men—men who have looked upon life from a different viewpoint beyond their wildest conception. Many more than we have conceived of, have psychoneuroses as a consequence of their experience. From the lonely watch on the troop ship, in the dreary wastes of the mid-Atlantic, surrounded by Stygian dark-

ness, with the terrors of submarine warfare added to the already existing terrors of the deep; to the shock of a nearby bursting shell, with its three hundred tons pressure to the square inch, all the experiences of war have contributed their quota to the development of psychoneuroses, in multiple varying degrees. These men have come back to our farms and cannot follow the plow. They have come back to our factories and cannot tend the machines. They have come back to our workshops and their hands have lost their cunning with their tools, and they have come back to our ranches and are unable to follow the trails.

The nation must adopt another class of wards and be burdened for another generation with their weakened progeny. We, as guardians of the outposts of human welfare, the physicians and surgeons of the silent places, must learn to know and care for our afflicted brother. To the physical and psychoneurotic effects of long and arduous warfare, we can trace the downfall of the Grecian nation, the decay of the Roman Empire, and the decadence of Spain.

A clinical case is presented, that bears out the above hypothesis:

X was a farmer's son in an intelligent but mentally undeveloped community. He was twenty years old and a bright boy for his station. He had begun working for himself, and had already a small bank account. He was considered quite bright by his associates and was industrious, working at lumbering when the farm did not require his service. He left school at about the sixth grade to go to work, was engaged to a young woman of his own station, whom he expected to marry as soon as he could prepare a suitable home. He was the best rifle shot in the community. He had never been more than fifty miles from his home. He had a vague idea that there were cities somewhere, where more than several hundred persons lived. He had heard of France and England. Having been told that he was within the draft age, he did not wait to be notified of his selection, but offered himself for service. He was accepted, sent to a southern training camp where he saw more men congregated than he had thought existed. Within a very short time he was sent to a port of embarkation where he saw his first ship and first large body of water. In a congested compartment, surrounded with foul air and supplied with strange food, among strange

men, he listened to "Munchausen" narratives and was instructed in the irresistible abilities of the submarine and the unheard of powers of high explosive armament. By the time he reached foreign soil the "Charge of the Light Brigade" was a spring love affair when compared to what he expected to happen. He was herded into a cattle car with a thin layer of straw for bedding and transplanted somewhere, in some direction. They needed his unit at the front badly, and with psychologic disturbance hardly to be imagined, he was conducted to the front line, given a post of vantage and, amid the roar of artillery, the rattle of rapid fire arms, and an accompaniment of circling airplanes, he was told to exercise his sharpshooting ability in picking off the enemy a few hundred yards away. His mind did not entirely fail him, his thinking and reasoning powers were reduced to doing what he was told to do. He did not expect to live from one moment to the next, and the efficiency of every sense was reduced to the minimum.

The trench was blown up on either side of him, he saw the limbs of his comrades hurtling through the air about him, and the vibrations from the detonations were changing the character of every cell in his body. He did not get a scratch.

The armistice came.

Back over the sea he was transported, freighted to near his old home, demobilized, and went back to the little country home on the hillside. The old farm did not look natural, the mother and father were almost strange

beings, the sweetheart was a different woman, and he was not the same man. After a few days of impersonating the hero in a melodramatic tragedy, he married the girl that expected him to, and started in to make a living and a home. He could not do a man's work and he could not stay with a job to its completion. Where he could formerly make six trips to the saw mill with his team, he could make but three now. A careful physical examination reveals no organ or sense in any diseased state. He acts more like a child than a man.

He is suffering from a psychoneurosis incident to his war experience.

Many such clinical examples could be repeated with slight variations, and with all the degrees up to instantaneous, violent insanity. First, we must recognize the importance of these psychoneuroses; then we must devise some means to restore these unfortunates to a normal condition. I fancy that patient, persevering direction will prove the most valuable remedy at our command. We must need much of all three, as an observation of those who wore the "Blue and the Gray" should convince us, for many of them are the "broken in health" that fill our pension rolls.

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OUR NEW DRESS

The improvement in the style and general appearance of the journal, inaugurated with this issue, is due to the determination of the Board of Managers to put into effect plans which they have cherished for several years, but were forced to hold in abeyance pending a reduction in cost of publishing and the accumulation of some surplus funds to carry an improved journal through the first year.

Beginning with this issue, it is hoped that SOUTHWESTERN MEDICINE will begin to justify the hopes and faith of the organizations which founded it, and will become a power in medical and scientific circles of the southwest.

If the individual members of the four organizations which this journal represents will supply that loyalty and constructive criticism which any such medium as this must have to succeed, the Board of Managers and Editorial Staff will, from this time forward, endeavor to bring forth each month a journal of which we can justly be proud.

The increased size of the magazine will call for many more papers than we have heretofore had supplied to us. The original papers read before county societies, if carefully prepared, should be sent to this journal for publication.

The news columns will depend absolutely upon the co-operation of interested county society secretaries. If the reports of county society meetings, with a few personals, are sent to the Managing Editor, promptly, the value of the journal will be greatly enhanced.

The value of the journal as an advertising medium is in direct ratio to the interest which the general medical profession of the southwest takes in the publication. And our ability to publish a creditable journal will depend on our value as an advertising medium, since the advertisers pay the cost of publication.

The Board of Managers and Editorial Staff stand ready to go,—in fact, have already started. May we have the support of a united and appreciative constituency?

MOTHER M. PAUL

"The arresting characteristics of Mother Paul were a great heart and deep sympathy for suffering in all forms, combined with unusual business ability. This rare combination of head and heart was, above all, deeply religious. Many poor and sick were befriended by her which only the Recording Angel knows about, thus imitating her great patron,—Saint Paul,—who made himself 'all to all.' Before entering the Convent, she was a capable and efficient teacher, relinquishing this work to obey the call of the Good Master, when he whispered to her young heart, 'Follow Me!'

"She has gone to meet this Master for whom she has labored so long and faithfully and to hear from Him the words, 'Well done, thou good and faithful servant.'"

These words of appreciation from one of her close friends and co-workers in the order of Sisters of Mercy, will find a ready echo in the minds and hearts of medical men of Phoenix and the entire southwest, for in the death of Mother Paul, the medical profession of Arizona and neighboring communities has suffered a great loss. She has been identified with medical progress and hospital work in this state for thirty years, during which time the hospitals established by her have invited medical and surgical progress which would not, otherwise, have been possible.

Mother Paul was born in Ireland in 1857, her name in the world being Margaret O'Grady. As stated above, she was a teacher until she entered the Convent in 1881, where she became Mother

Superior in 1886. She started the Mercy Hospital in Prescott in a small building in 1894, the present building being erected in 1894 and the chapel in 1914.

St. Joseph's Hospital in Phoenix was started in 1895 in a small house in a corner of the block occupied by the present fine group of buildings. The main building was destroyed by fire in 1917, but was soon rebuilt in a larger and more permanent form. For some years, Mother Paul has been the active head of this Hospital, with general supervision over the other hospitals of the order in Arizona. A large surgery and chapel are under construction at present and, when completed, will realize the plans of Mother Paul for this institution, for the present. The organization of the hospital upon an open staff basis, as required by the College of Surgeons and Hospital Association, is another of her plans which is rapidly being accomplished.

The hospital at Nogales was established in 1905, and has grown into a commodious institution which serves Southern Arizona and Northern Mexico.

In New Mexico, she established the Academy of Our Lady of Lourdes, and St. Joseph's Sanatorium at Silver City.

Aside from the industrial hospitals, the physicians and surgeons of Arizona owe more to the executive genius and untiring energy of Mother Paul than we do to any other one individual, and one and all we join her sorrowing co-workers and the Catholic Church of the state in mourning a common loss.

W. W. W.

THE PHOENIX MEETING

The Seventh Annual Meeting of THE MEDICAL AND SURGICAL ASSOCIATION OF THE SOUTHWEST was a complete success from any point of view. More I can not say. But, as one of the visitors who was so delightfully entertained, I feel that the above statement falls far short of expressing the scientific and social results of the meeting. From the moment of our arrival until our departure, it was one continuous round.

To mention all the notable papers would be impossible without a reprint of the program. Suffice it to say that never within my experience of these meetings have we listened to papers which were better prepared or more interesting. Each one showed that evidence of careful reading and observation which makes a hearer feel that he is getting something authoritative. There was no "cribbed" message nor any instance of hodge podge of current literature thrown together for a place on the program.

In keeping with the quality of the papers were the discussions. In practically every instance the introducer of the discussion had gone into the subject, apparently as thoroughly as the essayist, and made an earnest effort to add something of value which the essayist may have missed or to point the less obvious conclusions that might be drawn from the work.

The clinical material was well gotten up. The demonstrator was always prepared to answer, without hesitation,

any questions that might be propounded. As an extremely valuable adjunct, it might be noted, technical points were always well brought out. All too frequently a painstaking and exact exposition of the technic is glossed over for the spectacular. The demonstrator seeks to impress one with his wizardry or necromancy, if I may so express it, trying to cover up the painstaking points of technique which are so essential to successful diagnosis and treatment. These faults in a clinical program were not in evidence.

It may be noted in passing that one of the El Paso doctors learned in Phoenix that the cause of his hay fever was not what he had always thought, but was due to a plant to which he had given absolutely no consideration.

The commercial exhibits at this meeting were the most complete ever shown at a medical meeting in the southwest, and the exhibitors expressed themselves as being well pleased with their arrangements and entertainment.

From a social point of view, my idea of sitting on the world is to be in constant attendance at various gatherings in Phoenix. We were wine and dined, no end. How these Phoenix boys can get away with it, is a mystery to me. They stayed up to see us safely tucked into the downy and then were waiting for the earliest of us, with morning smiles and a brace of grape fruit the next morning. It must be the climate.

I hold no brief to speak for the visiting ladies—except my own—and she says they had a grand and glorious time. She further says that she heard no one say anything to the contrary.

That makes it unanimous.

PAUL GALLAGHER.

ADRENALIN

Adrenalin has been associated with the name of Parke, Davis & Co. for so many years that one suggests the other. It was that firm which met the challenge of therapeutic progress in 1900 by directing its research work to the isolation of the active principle of

the suprarenal gland, and which early in 1901 announced the success of its investigations and experiments. Since then Adrenalin has been universally recognized as a P. D. & Co. product—which it still continues to be.

A neat little brochure on "Adrenalin in Medicine" is offered by the manufacturers to interested physicians.

MINUTES OF THE SEVENTH ANNUAL SESSION OF THE MEDICAL AND SURGICAL ASSOCIATION OF THE SOUTHWEST, HELD IN PHOENIX, ARIZONA, DECEMBER 1, 2, AND 3, 1921.

Business meeting held Saturday afternoon, December 3rd. Dr. James Vance, president, presiding.

In the absence of Dr. J. R. Van Atta, secretary and treasurer of the organization, and at the request of Dr. Vance, the president of the Association, Dr. Paul Gallagher of El Paso acted as secretary-treasurer. The minutes of the El Paso meeting were read and approved. The report of the secretary-treasurer was adopted. The audit of the funds of the Association was read and approved.

Dr. Warner Watkins of Phoenix, nominated Dr. M. K. Wylder of Albuquerque, New Mexico, as the next president of the Association. Dr. Joel Butler of Tucson, seconded the nomination. Dr. Payne Palmer of Phoenix, offered the motion that the nominations be closed and that the secretary cast the unanimous ballot of the Association for Dr. Wylder, and Dr. J. W. Cathcart of El Paso, seconded the motion. There being no discussion, the motion was put and carried and the secretary was instructed to cast the unanimous ballot of the Association for Dr. M. K. Wylder for president.

Dr. James Vance at this point appointed Dr. J. E. Bacon of Miami and Dr. F. P. Miller of El Paso as a committee to induct the new president into his chair. The rest of the meeting was in charge then of the new president, Dr. M. K. Wylder of Albuquerque.

Dr. Paul Gallagher of El Paso, nominated for first vice-president, Dr. J. R. Van Atta of Albuquerque, New Mexico. The nomination was seconded by Dr. James R. Vance of El Paso. Dr. Palmer made the motion that the nominations be closed and that the secretary cast the unanimous ballot of the Association for Dr. J. R. Van Atta, and Dr. Cathcart of El Paso seconded the motion. There being no discussion, the motion was put and carried and the secretary was instructed to cast the unanimous ballot of the Association for Dr. J. R. Van Atta for first vice-president.

Dr. Joel Butler of Tucson, nominated for second vice-president, Dr. Willard Smith of Phoenix. Dr. J. W. Cathcart of El Paso seconded the nomination. Dr. Payne Palmer of Phoenix, made his usual motion, which was seconded by Dr. Felix Miller of El Paso. There being no discussion, the motion was put and carried and the secretary was instructed to cast the unanimous ballot of the Association for Dr. Willard Smith for second vice-president.

Dr. Payne Palmer of Phoenix, nominated Dr. Paul Gallagher of El Paso, secretary-treasurer, and Dr. J. W. Cathcart of El Paso seconded the nomination, but on explanation that Dr. Paul Gallagher would not accept, Dr. Payne Palmer withdrew the nomination.

Dr. J. E. Bacon of Miami, nominated for secretary-treasurer, Dr. H. R. Carson of Phoenix, Arizona. The motion was seconded by Dr. J. W. Cathcart of El Paso. Dr. Sweek of Phoenix, made the motion that the nominations be closed and that the secretary cast the unanimous ballot of the Association for Dr. H. R. Carson, and Dr. Hugh Crouse of El Paso seconded the motion. There being no discussion, the motion was put and carried and the secretary was instructed to cast the unanimous ballot of the Association for Dr. H. R. Carson for secretary-treasurer.

In line with previous practice in the matter as suggested by Dr. Paul Gallagher, El Paso, the retiring president, Dr. James Vance, was nominated for the position of trustee to serve for three years. The nomination was seconded by Dr. D. F. Harbridge of Phoenix, Arizona. There being no further nominations, the ballot was put viva voce vote and Dr. James Vance was duly elected trustee.

In line with his usual efficacious expressions, Dr. W. Warner Watkins of Phoenix nominated El Paso for the next meeting in 1922, the Eighth Annual Session. The nomination was seconded by Dr. Payne Palmer of

Phoenix. There being no other nominations, El Paso was selected for the next meeting place.

It was moved by Dr. Willis Smith of El Paso, and seconded by Dr. Felix Miller of El Paso, that the attached list of new members be accepted. The applications were read and, without a dissenting voice, the entire list was accepted by the Association.

Dr. Joel Butler of Tucson, addressed the meeting with regard to the thanks which the Society owed to Phoenix for the splendid program and entertainment which had been offered. He proposed the motion that the Society go on record as thanking the Maricopa County Medical Society for the entertainment. The motion was seconded by Dr. Felix Miller of El Paso, and carried without a dissenting voice.

Dr. Hugh Crouse of El Paso, spoke of the thanks which the Society owed to the Pacific Coast Roentgen Ray Society for their splendid co-operation in making the meeting the most successful that we have had so far. He proposed the motion that a vote of thanks be sent the Society. The motion was seconded by Dr. J. A. Rawlins of El Paso. The discussion which developed was all in favor of the motion, so that when it was put it carried.

The old subject of the Journal was then brought up for discussion. Dr. James Vance of the Board of Managers assured the meeting that, although the Journal at present was not without a peer, that next year it would be considerably better. He laid a good deal of the blame for the poor appearance of the Journal upon the printers. He stated that the contract between the Board of Managers and the printers who now conducted the Journal, would expire within a short time and that a new contract would be made with some other organization that would assure better service for the coming year. He spoke of the possibilities of illustrations and further assured us that, with a little extra funds in the treasury, as we have now, we should be able to get out some very satisfactory illustrations for the coming year. He made a plea for the preservation of the Journal. Dr. Paul Gallagher of El Paso, called the attention of Dr. James Vance and the members of the Association to the fact that Dr. Vance, for the Board of Managers, had made a statement the previous year so like the present statement that one might be a verbatim copy of the other. He doubted whether it was possible, without putting in a great deal more work than the Journal was at present getting, to have anything like a representative publication and rather than publish for another year a fiasco such as we have had the past year or two, he would scrap the whole thing because the Journal, as it stands now, could make a favorable impression upon none of our colleagues.

Dr. W. Warner Watkins, associate editor of the Journal for Arizona, stated that he believed a large part of the fault in the publication was to be laid upon the directors of the

printing company. He said that he had written the printing company on two different occasions for a statement of indebtedness of some of the Arizona members and had never had a reply. His opinion was that any company which did not attend to its own business could certainly not be expected to attend to other matters with any degree of dispatch and correctness for any other organization. He was in favor of securing other printers in some other locality because certainly the material is at hand with which to make an excellent Journal.

Dr. K. D. Lynch of El Paso, the editor-in-chief of the Journal, offered the statement that he must be the goat. He asserted that it was impossible to get any sort of a definite statement upon any subject from the printing company with whom we are now affiliated. For a year, he said, he had been trying to get the printing company to send a statement of the money due from the New Mexico State Medical Society, and he believed that, up to the present time, the bill had not been rendered. He wanted to make it plain to the members of the Association that, without Dr. W. Warner Watkins' help, he would have been even more seriously embarrassed in getting out the Journal, because at no time had he appealed to Dr. Watkins on any matter without getting a very prompt and satisfactory response.

Dr. A. G. Shortle of Albuquerque, moved a vote of confidence of the officers conducting the Journal. This motion was seconded by Dr. A. Wallace of Nogales, and there being evidenced no further indication of casting bricks, the motion was put and carried.

Dr. W. Warner Watkins recommended that the trustees be provided with authority to make whatever arrangements they saw fit with publishers. Dr. James Vance of El Paso, stated that, speaking for the Journal officers, he was certain that they all appreciated very much the sentiments expressed by the vote of confidence, but that another step should be taken in the publishing of the Journal and that was that a new manager of the Board of Directors should be selected and that he should be given authority to spend some money for proper illustrations. Dr. W. L. Brown of El Paso, offered the suggestion that no motion need be put or any discussion indulged in as the Journal was already permitted a subscription price from every member of the Medical and Surgical Association of the Southwest to be used for this purpose.

Dr. James Vance of El Paso, brought up the matter that there were several applications from men of other states than those provided for in our by-laws eligible to membership, and he could see no reason why we should not take in members from other states. He therefore offered for the first reading the following amendment: That the geographical limits of the Association now set should be removed and that we accept members from

any part of the country from which they chose to come. The amendment offered was seconded by Dr. Willis Smith of El Paso. A slight discussion developed which was in favor of the amendment and on being put to a vote, was accepted as a first reading.

Dr. Paul Gallagher of El Paso, offered the suggestion that in view of the circumstances which had here arisen and that no secretary had been in office to register the visitors and to take proper minutes of the meeting until this, the final hour, that the election of officers should take place in the morning of the first day of the session—the officers to assume their places at the expiration of the meeting, as at present. He proposed this as an amendment. Dr. J. M. Greer of Mesa, offered that this be considered the first reading of this amendment and the motion was seconded by Dr. Joel Butler of Tucson. A slight discussion developed which was in favor of the motion which, when being put, carried.

PAUL GALLAGHER,
Secretary pro tem.

NEWS ITEMS

NEW MEXICO

Personal—Dr. Frank E. Tull, secretary of The New Mexico Medical Society has moved to Los Angeles. During the interim between now and the state meeting in April, Dr. J. W. Elder, the treasurer, will attend to the duties of secretary.

Albuquerque Sanitarium—Dr. Shortle is contemplating an addition to his institution which will double his present capacity. With this enlargement, Albuquerque will have sanitarium and hospital beds, in its various institutions, for 500 patients.

State Meeting—The New Mexico Medical Society meeting will be held in Gallup some time in April. It will be recalled that, beginning with last year, this Society changed its meeting time from the Fall to the Spring.

EL PASO

Dr. Walter Dandy, a Visitor—The El Paso County Society entertained Prof. W. E. Dandy of Baltimore, at their annual meeting on December 19th, held in Juarez.

Dr. Dandy gave his lecture on "Diagnosis of Brain Tumors" with illustrations of method of localization by ventriculography. Following this meeting, he left for Phoenix, where he addressed the Maricopa County Society, and then left for Los Angeles to speak before the Los Angeles County Society.

ARIZONA

The Arizona Hospital & Sanatorium—The old Arizona Hospital has recently reorganized under this new name, with the following officers: Dr. W. V. Whitmore, President; Dr. C. W. Mills, Vice-President; Dr. C. E. Patterson, Secretary; Dr. Meade Clyne, Treasurer. The staff is composed of the following members and specialties:

Dr. J. I. Butler, Surgery.
Dr. Meade Clyne, Surgery.
Dr. Jeremiah Metzger, Tuberculosis.
Dr. C. E. Patterson, Ear, Nose, Throat.
Dr. E. W. Hayes, Tuberculosis.
Dr. C. T. Dulin, Eye.
Dr. C. W. Mills, Tuberculosis.
Dr. B. F. Morris, Eye, Ear, Nose and Throat.
Dr. Ira E. Huffman, Obstetrics and Medicine.
Dr. W. V. Whitmore, Medicine.

This combines the staffs of the Arizona Hospital and the Tucson-Arizona Sanitarium.

Personal—Dr. R. J. Stroud, formerly surgeon for the Shannon Copper Co., at Gleeason, and surgeon of the Cochise County Hospital, at Douglas, has moved to Tempe, Arizona, and is associated with Dr. R. L. Alexander.

Personal—Dr. Chas. S. Vivian of Phoenix, is the recipient of congratulations upon the birth of a son—his third—shortly before the holidays. Phoenix has a wonderful climate.

St. Luke's Home—This sanitarium has completed the residence for the resident physician, and is making other improvements on the property.

Health Center, Phoenix—The Maricopa County Anti-Tuberculosis Society and the Free Clinic were recently amalgamated into one organization—to be called the Maricopa County Health Center, which will perform the functions of both the former organizations, with some additions. The officers for the year 1922 are:

Rev. B. R. Cocks, President.
Dr. Warner Watkins, Vice-President.
Mrs. Dwight B. Heard, Secretary.
R. C. Foster, Treasurer.

There is a Board of Directors of fifteen members, and an Executive Committee which will have immediate charge of the Health Center work. The Executive Committee consists of: B. R. Cocks, Mrs. Dwight B. Heard, Dr. H. B. Gudgel, Mrs. H. B. Wilkinson and W. J. Horspool.

St. Joseph's Hospital—This hospital is building a new wing to house the operating rooms and the chapel. There will be two large, modern and thoroughly equipped operating rooms on the ground floor and the chapel on the second floor. A large room adjacent to the operating rooms has been designated for the laboratory of the hospital. With these improvements and the organization of the staff, the hospital is rapidly realizing its purpose of standardization according to the specifications of the American College of Surgeons.

Good News for Arizona—The contemplated opening of the copper mines in Arizona about February 1st is the best news which Arizona has heard in a year. To those outside of Arizona, and to many of those in the state, the relation of the mining industry to every other activity in the state was not fully appreciated until the mines closed.

Practically all of the large mines have kept their hospital organizations intact, ready to resume their share in the mining activities at a moment's notice. This has been done usually at a great loss to the mines, since they had no income to meet the expense of upkeep.

Jerome—Just prior to the closing of the mines, the United Verde Extension Hospital was completed. This represents the last word in hospital construction in this state, being rivaled only by the Calumet and Arizona Hospital in Bisbee, for modern equipment, lavishness in furnishings and convenience in arrangement. The hospital has not yet been opened, but will be shortly after the opening of the mines in Jerome.

Annual Meeting of The El Paso County Medical Society—The El Paso County Medical Society held their annual meeting on December 19th.

The meeting was held in Juarez, and the scientific feature was the address of Dr. W. E. Dandy of Baltimore, on "Diagnosis of Brain Tumors."

The following officers were elected for 1922: Dr. R. B. Homan, President; Dr. T. J. McCamant, Vice-President; Dr. E. W. Rheinheimer, Secretary-Treasurer; Dr. E. B. Rodgers, Librarian; Drs. F. D. Garrett, J. B. Gray and B. W. Wright, Board of Censors; Dr. Paul Gallagher, Associate Editor, Southwestern Medicine; Drs. James Vance and H. H. Stark, members of Board of Managers, Southwestern Medicine.

Annual Meeting of The Maricopa County (Ariz.), Medical Society—The annual meeting of this Society was held on the night of November 24th, in their assembly room. The scientific address was given by Dr. Gerald Webb of Colorado Springs, on the subject of "Postural Rest." The following officers were

elected for the year 1922: Dr. H. B. Gudgel, President; Dr. L. H. Thayer, Vice-President; Dr. Fred J. Holmes, Secretary; Dr. R. L. Larson, Treasurer.

ABSTRACTS

MODERN METHODS FOR THE PREVENTION OF DIPHTHERIA

ABSTRACTS FROM CURRENT LITERATURE

Fleischer & Shaw, Jour. A. M. A.
Nov. 26, 1921.

Authors detail the management of an outbreak of diphtheria in a private school containing about 150 students. The summary of their methods is as follows:

1. Immediate isolation of sick children.
2. Cultures on all.
3. Schick tests on all within 24 hours.
4. Antitoxin to all children with positive Schick at end of 48 hours.
5. Reculturing and isolation of carriers and those sick from the well.
6. After outbreak is controlled, active immunization of all with positive Schick reactions—using TAT mixture.

DOES THE NEGATIVE SCHICK TEST INDICATE PRESENT AND FUTURE SECURITY FROM DIPHTHERIA? *Park: Arch. Ped.*, June, 1921.

This article is a criticism of Blauner's report in the American Journal of Diseases of Children (May, 1921), in which he reports nine cases of tonsillar infection clinically resembling diphtheria in children who had given negative Schick reactions. Park doubts the diagnosis of diphtheria in these cases, and reports investigations of his own to support his contention that these were not diphtheria.

He compares the Schick test with a vaccination against small pox, and considers the failures of the Schick test to be due to improper technic.

DIPHTHERIA PREVENTIVE WORK. *Zingher: Arch. Ped.*, June, 1921.

This author, perhaps the best authority on the preventive work in diphtheria, gives a report of his work in the public schools of New York City. His abbreviated summary and conclusions are as follows:

1. Schick test was applied in the four months preceding the report to 52,000 school

children in New York; those reacting positively were injected with toxin-antitoxin.

2. Natural immunity depends to a large extent on "contact immunity" after repeated exposures and mild infections with the diphtheria bacillus.

3. Children of the well-to-do are less immune than the children of the poor; crowding and close contact of the latter accounts for this development of immunity.

4. Race and heredity influence the development of immunity.

5. Negative pseudo-reactions were frequent in older children and control tests should be used in all children over 5 years.

6. Six months or longer should intervene before testing for immunity after toxin-injection.

7. Three injections of a smaller amount is better than two of a large amount. Mixture should be slightly toxic for best results.

8. Children under six months should not be injected with toxin-antitoxin, as they do not respond.

9. All children from six months to five years should be injected with toxin-antitoxin, the Schick reaction being omitted.

10. To place diphtheria preventive work of a city on a practical basis, it is advisable for the present, at least to simplify the work by omitting the Schick test and immunizing all children of the incoming classes with toxin-antitoxin.

11. After six months, the Schick tests should be made and no child considered immune until it gives a negative Schick reaction.

12. Children above the incoming classes should have the Schick test and immunization, if positive.

13. Care should be taken to see that the reagents used are reliable, or very misleading results will occur.

THE SCHICK TEST IN PRIVATE PRACTICE. *Byard*: Arch. Ped., June, 1921.

This author gives report on his work in his private practice. He surveyed 192 families of his private practice, and 163 of them accepted his program in whole or part. Out of these, he inoculated 317 children with TAT mixture. Of these he subsequently gave Schick tests to 299, of whom five, or 1.7%, failed to develop immunity. He concludes:

"The high degree of immunity warrants an urged, aggressive program. Average, conservative families will view as an intelligent procedure the preliminary Schick test, the post-inoculation, re-test and, if needed, further inoculation. The responsibility is ours. The public, sufficiently advised, will prudently cooperate in this undertaking which so importantly concerns it."

STATISTICAL REVIEW OF DIPHTHERIA. *Crum*: A. M. Jour. P. H. May, 1917.

This is the best statistical review of diphtheria which appears in current literature, and gives some very graphic figures. While the mortality rate has been reduced from about 75% to between 4 and 8 per cent, as the result of antitoxin, coupled with early diagnosis, no headway at all has been made against the morbidity rate. The number of cases has increased *pari passu* with the population, and we have just as high an incidence of diphtheria now as there was 40 years ago. Diphtheria still causes 3% of all deaths under 15 years in all countries, and in the Registration District of the United States the rate is 4.4%. Diphtheria still causes more deaths than whooping cough, measles or scarlet fever, the annual death rates in the United States Registration District being 17,000 for diphtheria, 10,000 for whooping cough, 9,000 from measles and 8,000 from scarlet fever. In the entire United States it is estimated there occur over 200,000 cases of diphtheria annually with over 10% mortality, or more than 20,000 deaths.

Despite the confidence which antitoxin gives the individual physician in his practice, diphtheria is still the greatest menace to childhood after the first year. In the critical school period, between 5 and 9 years, diphtheria causes 16% of all deaths. From this age, the danger rapidly decreases until at 20 years it causes less than one-tenth of one per cent of the total mortality.

HUMAN MYIASIS: *Dr. Edward N. Bywater*, Tucson, Ariz., Jour. Amer. Inst. of Homeopathy, January, 1922.

Three cases of infection from screw worms are reported—one discovered by the undertaker. The first case was a very marked infection, more than 150 worms being taken from the nose, with recovery. In the second case treated, between 50 and 75 worms were recovered; this case developed mastoid infection with symptoms which indicated invasion of the middle ear by the worms.

The classical article on this peculiar infection which is relatively common in the Southwest, is the one by Drs. Yount and Sudler, in the Jour. A. M. A., Dec. 7th, 1907. Dr. Yount, of Prescott, Ariz., had collected, at that time, twenty-three cases from Arizona, of infection with larvae of the screw worm (*Comptosia macellaria*—Fab.), which occurred during a single year (1905). The first nineteen cases were nasal infections; the other four were in (1) specific sore on cheek; (2) gangrene of heel; (3) infected wrist; (4) sore in axilla. Contrary to Dr. Bywater's observations, many of these cases were in white people. (Note: We recall seeing three cases of the late Dr. Plath's, several years ago, all in white people.—Ed.)

THE VALUE OF BASAL METABOLISM: *Rowe*, Amer. Jour. Med. Sci., August, 1921.

The value of metabolic rate determinations

in thyroid diseases is represented in the following conditions:

(1) Mild or definite cases of hyperthyroidism can be differentiated from neuroses and early tuberculosis, by basal metabolic rate determinations.

(2) The severity of an obvious case of hyperthyroidism can be more accurately determined through basal metabolism rate determinations, than by any other method of analysis.

(3) As a guide to the amount of roentgen ray therapy needed in a case of hyperthyroidism due to hyperplasia of the thyroid gland, basal metabolism studies are indispensable and are necessary for scientific work.

(4) The degree of toxicity of adenomas of the thyroid gland may be ascertained by metabolic rate determination.

(5) As a guide for the surgical removal of hyperplastic, colloid, and adenomatous thyroids, metabolic rate studies have gained recognition from the leading goitre men of the country.

(6) As a method of diagnosis for hypothyroidism and myxedema.

(7) As a guide to correct thyroid administration.

NEUROSYPHILIS AND INTRASPINAL THERAPY: Schaller & Mehrrens, Arch. Neur. and Psych., Jan., 1922.

This comprehensive article from the Division of Neurology of Leland Stanford University, summarizes the methods of treating neurosyphilis in an admirable manner.

Basing the method of treatment on the pathology present, they adopt the classification of Southard and Solomon, of meningeal, vascular, parenchymatous, meningovascular and diffuse (meningo-vasculo-parenchymatous).

The vascular and meningovascular types are best treated intensively by way of the blood stream, while the drainage technic following a previous injection of arsphenamin intravenously, and the intraspinal methods of Swift and Ellis, Ogilvie and Byrnes, are to be reserved for refractory cases. They conclude that "in the treatment of the individual case of neurosyphilis, it would seem to be proper to begin with intensive intravenous and intramuscular medication, particularly in vascular, meningovascular and diffuse lesions. Failure to reduce spinal fluid findings to negative after a thorough trial should suggest the advisability of using more intensive methods. Drainage, combined with intravenous methods, again should be the procedure of choice when the facilities for more complicated methods are lacking or when symptoms of increased spinal fluid pressure are distressing. The Swift-Ellis, Ogilvie or Byrnes method should be reserved for cases resistant to the foregoing efforts. These resistant cases will be found particularly in tabetics."

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CARDIAC IRREGULARITIES*

E. AVERY NEWTON, M. D., F. A. C. P., Los Angeles, California.

The normal heart beat in all mammalia originates in the sino auricular node situated at the junction of the right auricle and superior vena cava. owing to this portion of the normal heart being more easily irritated than any other area. The stimulus arising here passes down over the auricles and through the auriculo-ventricular bundle, or bundle of His, and is then distributed to the ventricles, through the arborizations of the auriculo-ventricular bundle, stimulating the contractions of the ventricles.

The normal time of the passage of this stimulus from its origin, in the sino auricular node, until the response of the ventricles is about 17 to 20 hundredths of a second. Electrocardiographically, the response to the impulse arising in the sino auricular node is designated as "P" (Figure I). This is followed in from 17 to 20 hundredths of a second by the ventricular response designated as "R" (Figure I). The broad curve which occurs simultaneously with the second sound of the heart is designated as "T" (Figure I). These responses are followed by a pause or rest period until the next auricular contraction occurs. These three deflections of the string in the same direction, with the intervening pauses or quiescent periods, constitute the normal phases of the heart beat.

Occasionally we have a slight downward movement of the string at the end of the pause between auricular and ventricular response which is designated as "Q" (Figure I). And a downward movement at the end of the deflection "R" (Figure I) which is designated as "S" (Figure I). Slight deflections at these points are not considered as abnormal.

Stimulations arising anywhere outside the sino auricular node, in the heart, which are followed by a cardiac contraction, produce either cardiac irregularities or an abnormal contraction of the heart, with the exception of sinus arrhythmia, which is due to a non-stable irritability of the sino auricular node, and pulsus alternans, which is an irregular response of the ventricular contractions, as observed by palpation of an artery. Einthoven and Lewis both find no change in the electric contractions, nor any irregularity of rate in pulsus alternans.

The cardiac irregularities usually met with are: Sinus Arrhythmia, Heart Block, Auricular Fibrillation, Auricular Flutter, Paroxysmal Tachycardia, Extrasystoles, and Pulsus Alternans.

SINUS ARYTHMIA

Several related heart irregularities are due to variations in the rate at which

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the impulses are generated at the sino auricular node. A notable example is the irregularity of respiratory origin with which you are familiar. In this disturbance there is a gradual acceleration of the rate during inspiration and a slowing of rate during expiration.

In young subjects this is a normal phenomenon. During early life irregularities in which the whole heart participates and in which there is no constant relation to breathing, are seen. These irregularities are considered by many to be of normal origin. I believe they indicate lowered vitality. They are probably brought about by vagal disturbances.

Electrocardiographically, they are easily recognized. The electric curve is usually of normal form in which the auricular and ventricular elevations are seen. The irregularity is only in the rest period between beats (Figure II, leads 1 and 2), otherwise the normal rate of contractions of auricles followed by ventricles is observed.

Irregularities of sino origin are easily recognized. Most of the irregularities in childhood are of this kind and a majority of them are respiratory. They disappear in most instances on exertion or a slight rise in temperature, or by any cause that will increase the pulse rate. Also soon after the administration of small doses of atropine.

HEART BLOCK

Heart-block is partial, to complete, dissociation of the auricles and ventricles.

Partial heart-block may be an occasional prolongation of the time it takes the impulse originating in the sino auricular node to reach the ventricles, there being regular auricular contractions, to some of which there is no ventricular response (Figure IV).

Partial heart-block is of considerable clinical importance (Figure III); when continued for some time it tells of myocardial degeneration; when present for a short time only, of poisoning or acute heart lesions.

When in conditions such as acute rheumatic fever, cholecystitis, cystitis or other chronic infections, you find

the heart dropping a beat and it proves to be a partial heart-block, you can be sure the heart is being invaded by the bacterial organism or its products, and heroic treatment should follow.

Complete heart-block is the complete dissociation of auricles and ventricles (Figure IV). The auricles maintain their regular rhythm of from 66 to 80 per minute. The ventricles have taken on a rhythm of about 30 to 40, which is of ventricular origin.

If the ventricles did not contain some areas of primary cardiac tissue in which stimulus to contractions could and does originate, death would always follow the destruction of the auriculo-ventricular conducting bundle, as the ventricles would not functionate unless they had this property within themselves when no impulses originating in the auricles reach them.

AURICULAR FIBRILLATION

Auricular fibrillation is a condition in which co-ordinate contractions of the auricles have ceased. There is a constant twitching all over these two chambers. They are in constant dilatation and cease to perform their function of propelling blood into the ventricles. Electrocardiograms of this condition show auricular contractions of from 400 to 600 per minute.

This condition is very important owing to its frequency, ease of diagnosis, prostration of subject and yielding to treatment.

It is the old *pulsus irregularis* perpetuans which you have all seen, from which digitalis gained its fame and is most useful, being the only drug helpful in these cases.

AURICULAR FLUTTER

Auricular flutter is a condition of auricular acceleration in which the auricles contract at a rate of from 200 to 300 per minute. This rate is more rapid than the ventricles can follow, so that we usually have a heart-block in which every second or third auricular contraction stimulates a ventricular contraction (Figure VI), or any rate of block, may be present.

We may have an auricular contraction between the one to which the ven-

tricles respond and the ventricular response (Figure VI, lead 3 "aaaa").

This condition, as also fibrillation and tachycardia, occurs mostly in old people in whom there is myocardial degeneration, or in whom there is nutritional disturbances, as following influenza, etc.

If the heart muscle is markedly degenerated, we are apt to have cardiac dilatation, engorgement of the liver and dropsy.

If the heart is well supplied with energy, no embarrassment may be seen.

Inability of the patient to do work requiring much energy, and frequent attacks of tachycardia, occur. The response to treatment is the best guide to prognosis.

PAROXYSMAL TACHYCARDIA

Until recently paroxysmal tachycardia was thought to be due to very slight disturbances of cardiac innervation.

The electrocardiograph has shown the condition to be quite different.

The impulses originate outside the normal location or sino auricular node, usually in the auricles (Figure VI; note the difference in ventricular responses in leads 1 and 2) whereas, in rapid heart action following exertion, fever or emotion the beats arise in the physiological area and are only more frequent.

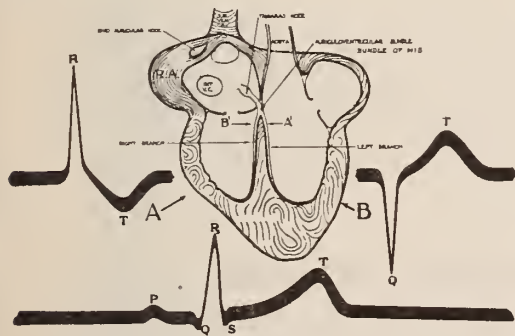


Fig. VII.—Modified Diagram after Lewis.

At the lower part there is a schematic drawing of a normal electrocardiogram. The drawing at the left represents what occurs electrocardiographically from stimulating the ventricle at "A," or if the auriculo-ventricular bundle is severed at "A." At the right is shown what occurs when the ventricle is stimulated at "B" or the bundle is severed at "B," showing right and left ventricular extrasystoles artificially produced.

EXTRASYSTOLES

Extrasystoles are responsible for most irregularities of the heart, especially the so-called "missing of a beat" you so often have patients tell you about. They occur at irregular intervals. I have seen them occur as often as every second beat (Figure VIII) and at all other intervals up to as many as 500 beats before another one appeared. Unless they occur often, they give very little real discomfort, except to the patient, who will count his pulse and become alarmed when it misses.

While they may arise in any part of the cardiac tissue, they are usually ventricular in origin. They usually occur just following systole. The next auricular contraction occurs while the ventricle is active (Figure VIII, leads 1 and 2); therefore, there is no ventricular response to this auricular contraction, as the heart muscle will not respond to more than one stimulus at a time. The pause following the extrasystole is called a compensation pause.

Right ventricular extrasystoles give an upward deflection (Figure VIII), while one arising in the left ventricle gives a downward movement of the string (Figure IX.)

Regardless of their form or origin, they are almost harmless and are only to be diagnosed to exclude some really serious condition such as heart-block and fibrillation. Electrocardiographically, this is easily done; by any other means there is often some difficulty.

I have always found them present following acute dilatations, which I attribute to the ventricular muscle being more easily irritated following this condition.

The same tissues in the ventricles which take on the origin of a ventricular rhythm in heart-block are the ones which become irritated and produce extrasystoles.

They occur frequently in intestinal disturbances, due usually to some products of putrefaction being absorbed into the tissues. All having this origin are cured by a laxative, especially a good dose of calomel.

PULSUS ALTERNANS

When we find an alternation in the arterial pulse by palpation which seems to be very marked, electrocardiograms

do not show any evidence of it.

When, however, this condition is associated with tachycardia, slight variations of the "P" and "T" amplitude are present.

DESCRIPTION OF PLATES

Fig. I. *Normal Electrocardiogram.*

Time in seconds, showing the auricular deflection "P" and the ventricular deflections "Q," "R," "S" and "T." The leads in this and all other illustrations are indicated at the left in Roman figures.

Fig. II. *Sinus Irregularity.*

This occurs in Leads 1 and 2. In Lead 3, the heart rate is regular. Lead 1 shows lowered electric response. Leads 2 and 3 show marked left ventricular preponderance. This electrocardiogram is from a case of marked left ventricular hypertrophy.

Fig. III. *Delayed Conductivity and Sinus Irregularity.*

Prolongation of the P-R intervals to .3 of a second. In Lead 1 there is a delay in auricular contractions and in auriculo-ventricular conduction time, heart rate 50 per minute. In Lead 2 the third beat is much delayed, while beats 1 and 2 are at the normal rate. In Lead 3 the second beat is delayed, the third beat follows at the normal interval, and the first portion of the fourth beat shows delay in auricular contraction. Partial heart block, the irregularity arising at the sino-auricular node.

Fig. IV. *Complete Heart Block.*

Entire dissociation of auricular and ventricular rhythms. Auricular rate 79 per minute. Ventricular rate 34 per minute. Notice the superimposing of auricular, of "P" complexes, on the ventricular complex.

Fig. V. *Auricular Fibrillation.*

In Lead 1, we have irregularity in rate of ventricular contractions, as well as in height of "R" summits, showing unstable or irregular electric generations. In Leads 2 and 3 we have a constant series of auricular contractions—"a." In Lead 2, the last ventricular response to the right is of different origin than the preceding four. In Lead 3, the first and last two ventricular responses are similar, the second and third are different in form, the fourth following a long pause is of another form, showing that in this lead the ventricles have responded to impulses arising from three distinct areas.

Fig. VI. *Same Case as Figure V.*

This electrocardiogram was made immediately after Figure V. The rate has markedly increased. A paroxysmal tachycardia has developed with auricular flutter, the auricular contraction occurring at the rate of approximately three auricular to one ventricular contraction. In Lead 3 there is one instance of four auricular contractions ("a") between ventricular responses. Note the marked difference in form of ventricular responses in this electrocardiogram from what occurred in Figure V. There was less than five minutes between the taking of the two electrocardiograms. At the time Fig. VI was taken, all the ventricular responses were of supra-ventricular origin.

Fig. VIII. *Extra Systoles.*

This electrocardiogram illustrates one form of the more frequent ventricular extrasystoles or premature contraction of the ventricles; also the regular occurrence of extrasystoles following every normal beat. This illustrates the importance of differentiating between heart block and extrasystoles. The pulse rate in this instance is 44, with 88 cardiac contractions, the extrasystoles occurring early in diastole before the ventricles have had time to fill. There is no pulse wave produced. The auricular contraction which occurs during the time the ventricles are in action does not produce a ventricular contraction, as muscle does not respond to more than one stimulus at a time. This beat arises in the right basal area of the ventricles.

Fig. IX. *Extrasystoles.*

Lead 1 represents extrasystoles arising in the left ventricle. In Lead 2, the third or center beat is of right ventricular origin. In each instance the "P" wave occurring during this contraction does not produce a ventricular response.

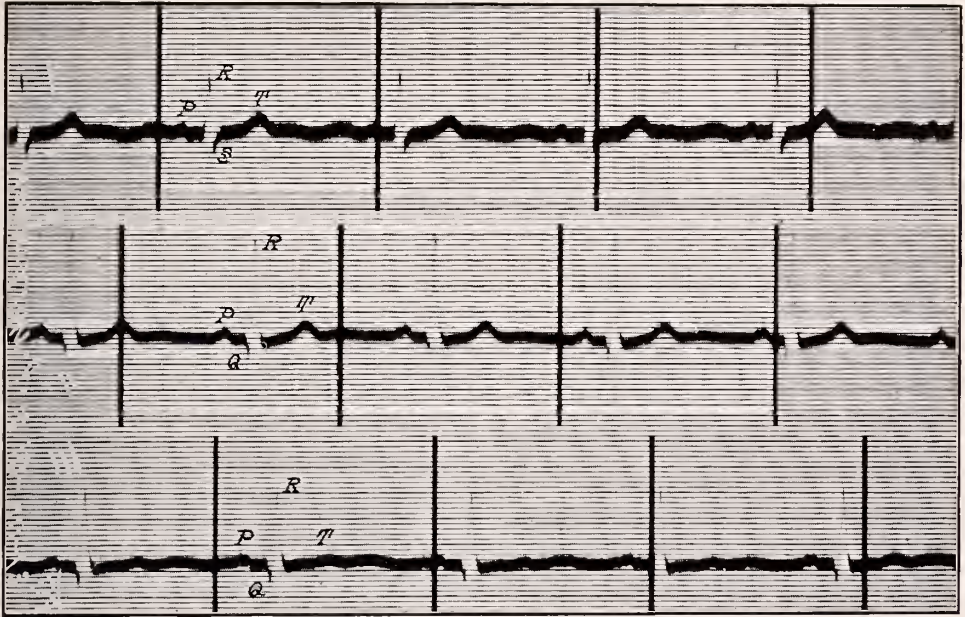


Fig. I. *Normal Electrocardiogram.*

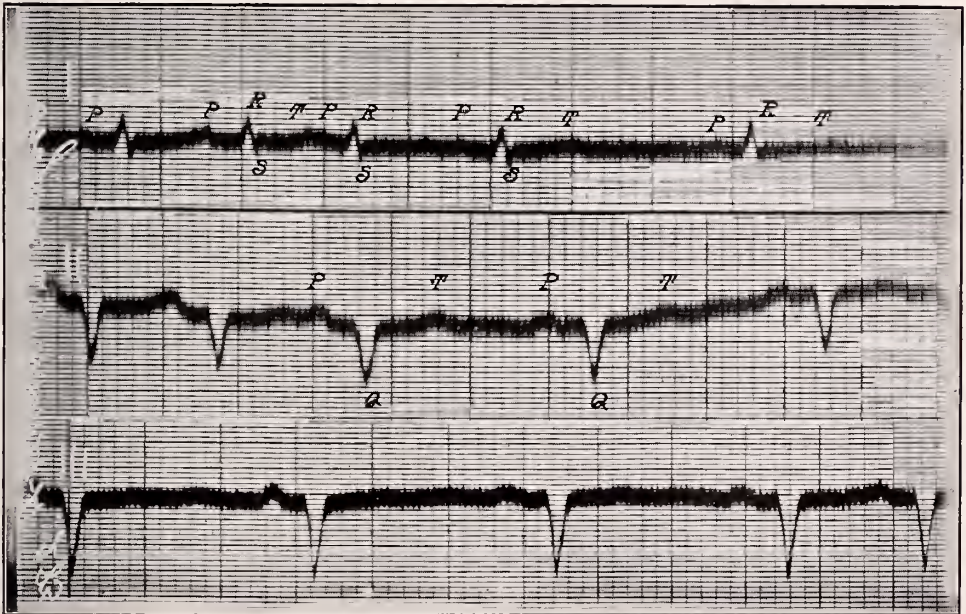


Fig. II. *Sinus Irregularity.*

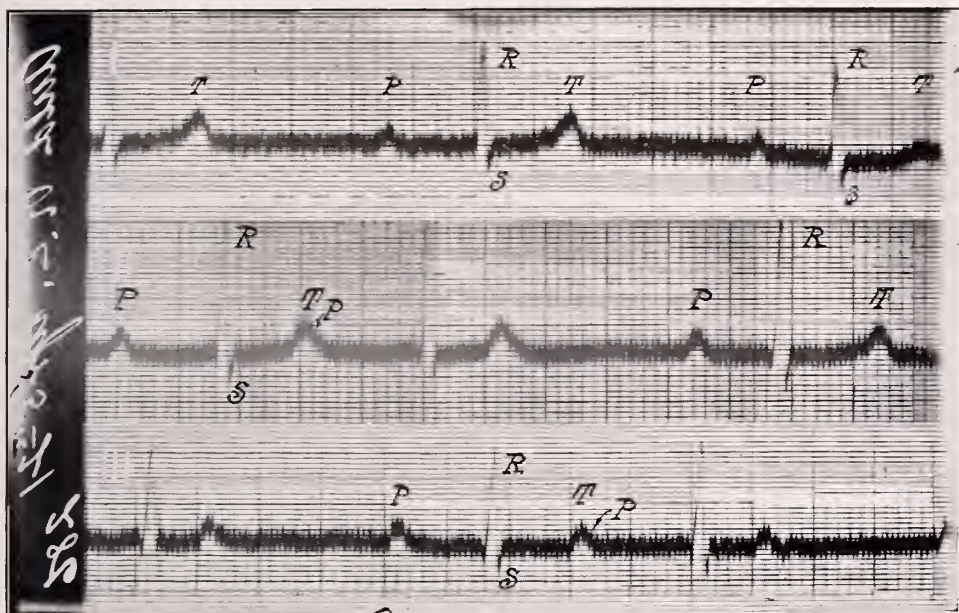


Fig. III. *Delayed Conductivity and Sinus Irregularity.*

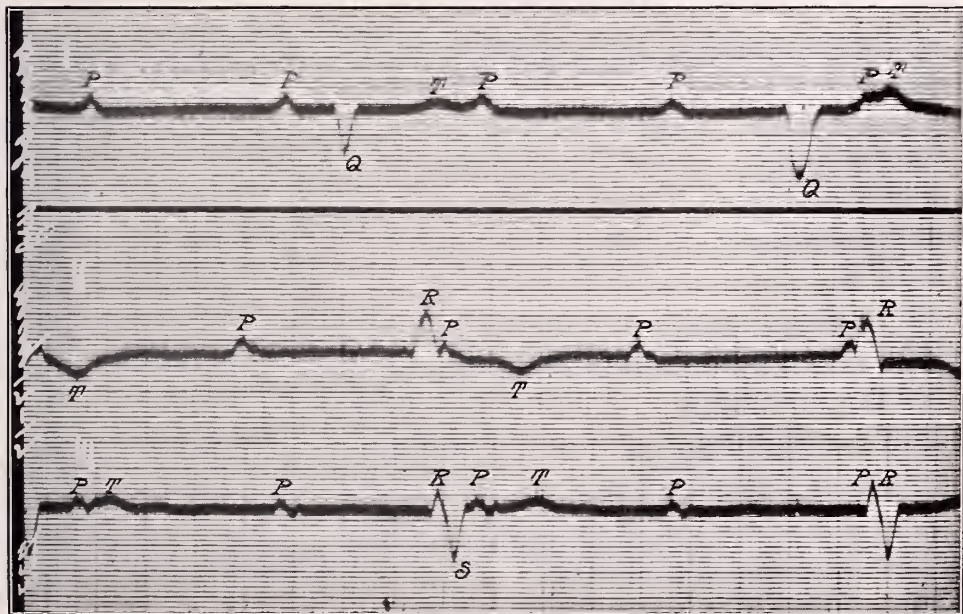


Fig. IV. *Complete Heart Block.*

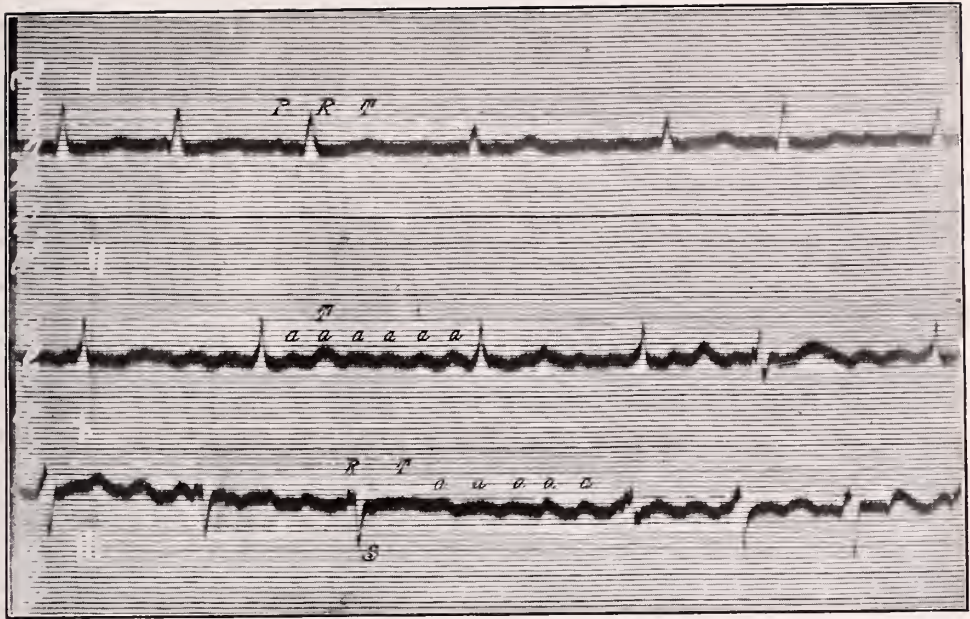


Fig. V. Auricular Fibrillation.

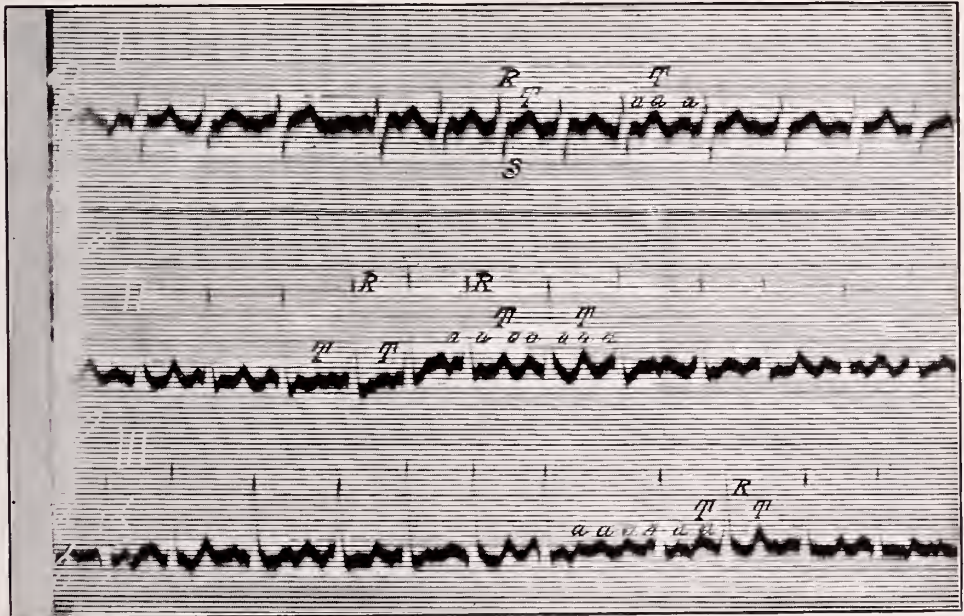


Fig. VI. Same Case as Figure V.

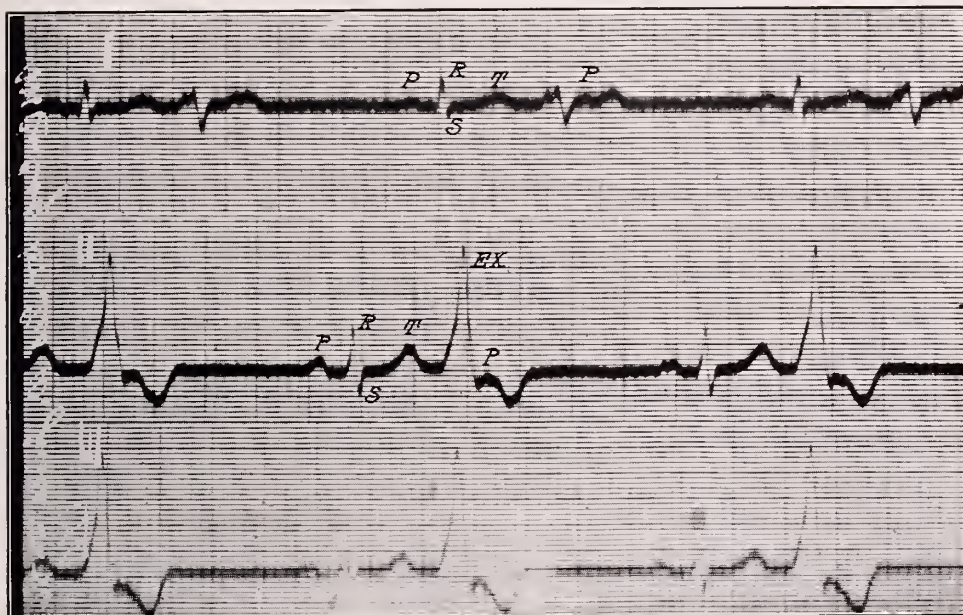


Fig. VIII. *Extra Systoles.*

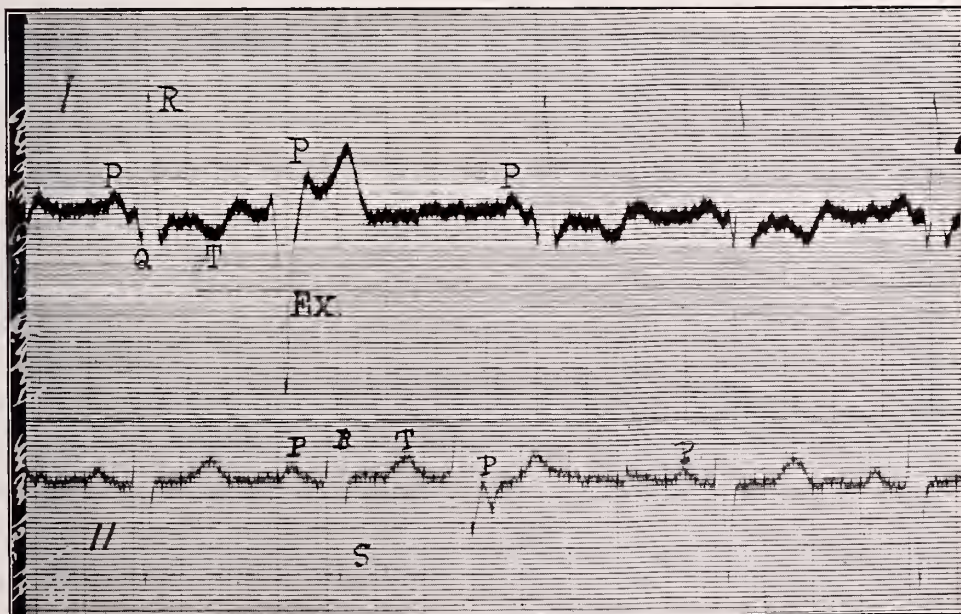


Fig. IX. *Extrasystoles.*

REPORT OF A FEW UNUSUAL LUNG INFECTIONS*

G. BURTON GILBERT, M. D., *Colorado Springs, Colorado.*

For many years we have all heard a great deal about the diagnosis of pulmonary tuberculosis. But it is only during the last few years that we have begun systematically to focus our attention on the diagnosis of non-tuberculous disease of the lungs. More and more we have been forced to realize that every case with sputum which is constantly negative for tubercle bacilli demands further search for the etiological agent. Pulmonary abscess, following tonsil operations and pneumonia, has become surprisingly common. Chronic bronchitis and bronchiectasis, which, as we have recently pointed out, are almost always associated with sinus disease have very frequently come to Colorado diagnosed as tuberculosis. Over 50 cases presenting this combination have been worked out in our office in the last two years. No small number of cases of carcinoma and other tumors have been found in lungs supposed to be tuberculous. Hyperthyroidism has added materially to the number of mistaken diagnoses.

Today, I wish to invite your attention to a few unusual lung infections, which may produce symptoms and signs exactly similar to those of pulmonary tuberculosis. I refer to primary infections with pathogenic moulds, fungi and spirochaetae. With your kind indulgence I will report in some detail a case each of Aspergillosis, Blastomycosis, Streptothricosis and Syphilis of the lung.

Case I. Mrs. S., age 35, came to Colorado from Indiana in May, 1920, with a diagnosis of pulmonary tuberculosis. Complaint, shortness of breath and cough. F. H.—Her paternal grandfather died of tuberculosis 30 years ago. Her mother had slight tuberculosis some 25 years ago with complete recovery. P. H.—Patient had typhoid fever at age of 11, scarlet fever at 21, and tonsillectomy 3 years ago. Ten years ago, after hard instrumental delivery, was much run down and had pleurisy pains, slight cough and some loss of weight but no fever or sputum. At this time she was

said to have tuberculosis, was given tuberculin and made a good recovery in California.

P. I.—Present illness began in January, 1920, with shortness of breath, cough, expectoration, rapid pulse, weakness and loss of 10 pounds weight in three months. Temperature was sub-normal. She showed no improvement from a rest cure of four months at home, so came to Colorado and entered Cragmor Sanatorium.

P. E.—Examination showed slightly impaired resonance over the upper portion of both lungs to the 4th rib and 8 v. s. with prolonged high-pitched expiration to the 2nd rib and 6 v. s. Fine and medium coarse rales were very numerous over the entire left lung and to the 5th rib and 8 v. s. on the right. Many of the rales were bubbling in character. Trachea was to the right by palpation. No enlarged glands.

X-rays of sinuses were negative.

X-ray of chest (Fig. 1) showed slightly increased peribronchial markings upward and outward from each hilus. Haemoglobin 80%. Total leucocytes 8,000; polymorphonuclears 68%. Wassermann and Complement Fixation for tuberculosis, both good negatives. Urine normal.

Sputum mucopurulent, about 2 ounces daily; many examinations were always negative for tubercle bacilli. Guinea pig inoculations did not produce tuberculosis.

In September, 1920, the patient returned to Indianapolis for a visit and while there Dr. C. P. Emerson succeeded in growing a pathogenic mould from her sputum (in pure cultures). This proved to be the *Aspergillus Fumigatus*, which we have since cultivated repeatedly from the fresh sterile sputum. In order to complete the identification of the organism spores should be injected into the ear of a rabbit, which will die in a few days of a general infection and show typical tubercles in the internal organs.

This patient has been given rest, fresh air, good food and tonics. Also small doses of potassium iodide, altho she does not tolerate this drug well.

Up to the present time neither the signs nor symptoms have changed materially. The disease is apparently not

*Read at the Thirtieth Annual Session of the Arizona State Medical Association at Tucson, April 15-16, 1921.

progressing, altho there are no signs of improvement.

COMMENT: The marked symptoms and extensive signs in the lungs compared to the few changes seen in the x-ray film (Fig. 1) are rather striking. The diagnosis could be made only by finding the organism in the sputum. These mould infections are sometimes secondary to tuberculosis. Bread moistened in milk, then autoclaved in a petri dish, furnishes a good culture medium.

Case II. Mr. G., age 39, laborer in a grain elevator in Kansas, was sent to the Modern Woodmen Sanatorium with a diagnosis of tuberculous laryngitis. Family and personal history are good.

Present illness began 3 months before admission with a severe cold and tonsilitis which settled in his larynx. He had to stop work one month ago because of weakness and loss of weight. On arrival there was slight dullness over the left apex, but no rales. Hoarseness was marked and there was pain in the ear at times. On the right tonsil were two small pin-point yellowish spots. The epiglottis was eroded in a V-shaped ulceration extending well on to the tongue. The entire mucous membrane of the larynx and cords looked as if they had been treated with silver nitrate. There were many small, slightly elevated, pin-point yellow spots, altho there was not much infiltration. A piece of tissue was removed for diagnosis. When sectioned, this showed many small abscesses containing the typical spherical, budding, encapsulated parasites of *Blastomycosis*. A few blastomyces were found in a smear from the larynx. Wassermann test was negative. Total leucocytes averaged 20,000 with 75% polymorphonuclears. Urine contained a trace of albumin and a few granular casts. Afternoon temperature averaged 99.4°. No skin lesions appeared. Patient was given potassium iodide in large doses but the laryngeal lesion continued to progress until a tracheotomy had to be performed and he was later fed by a tube. Dullness increased over the left lung, but there were very few rales. X-ray (Fig. 2) at this time (7 months after entering the sanatorium) showed very extensive general mottling on both sides, greatly in excess of that indicated by the physical signs. He died 5 months later, but no autopsy could be obtained.

COMMENT: The symptoms suggested tuberculosis, altho the laryngeal lesion did not look like tuberculosis. The lung signs were very few compared to the x-ray findings, which suggest the pathological picture of miliary and pea-sized abscesses coalescing to form larger areas with softening. The respiratory

tract is the common portal of entry for the *Blastomyces* in all systemic cases of the disease.

Case III. Mr. H., farmer from Iowa, age 24. Family and personal history good, except had pneumonia at 14 years of age and pleurisy on the left side two years ago.

Present illness began with hemorrhage of an ounce. Had some cough expectoration, and shortness of breath, but no loss of weight or strength. Went to New Mexico and was treated with tuberculin. On arrival at the Modern Woodmen Sanatorium examination of the lungs showed lagging of the left side, dullness over the left lower lobe with many fine and coarse rales over the left base. Vocal fremitus and whispered voice sounds were increased over an area 2x3 inches in the lower inner portion of the left back. Breath sounds were decreased above and almost bronchial below the 4th rib on left side near the sternum. Trachea and heart were considerably displaced to the left. Temperature touched 99 afternoons but pulse was normal. Weight 167. Sputum thick yellow about 2 ounces daily. Tubercle bacilli were never demonstrated by any method. When he had been in the Sanatorium 4 months, characteristic granules were found in the sputum and typical streptothrix were stained and grown on gentian violet agar. Altho he was given potassium iodide, the signs in the left lung continued to increase until there was dullness and moist rales throughout. X-ray (Fig. 3) shows density throughout left side especially opaque over base with no lung markings evident. Patient returned to Iowa and when last heard from 3 years after discharge was still alive, altho gradually failing in health.

COMMENT: Pathologically, there is marked tendency to extensive necrosis followed by tremendous scar tissue formation and great pleural thickening, the lesions usually being situated in the lower lobes. Certain varieties of streptothrix are more or less acid and alcohol-fast and may occur as short rods rather than the usual branching mycelium with ovoid spores. Claypole has originated streptothrichins (concentrated glycerinated bouillon cultures of these organisms) which are used intradermally for purposes of diagnosis. These organisms take the gram stain well. *Nocardia* is perhaps a better name for them.

Case IV. Mr. C., age 38. Entered Cragmor Sanatorium in October, 1919, with a diagnosis of pulmonary tuberculosis, altho tubercle bacilli had never been found in his sputum. During the few preceding months he had had several slight hemorrhages, considerable hoarseness, marked malaise, some dyspnea,

cough and expectoration. Temperature and pulse were normal. Examination of the lungs showed markedly impaired resonance and quiet breath sounds over the right upper lobe with slight dullness and absent breath sounds over the right base. No rales. Fluoroscopic examination showed a small amount of fluid in the right pleural space. Wassermann test was positive.

Patient gave a history of leutic infection 12 years previously—this had been treated by mercury for two years, off and on. He was given an intravenous dose of arsphenamin, .6 gm. During the next two days he had several hemorrhages of an ounce, and a slight fever. A little later he was given large doses of mercury hypodermically and all symptoms disappeared, altho he was badly salivated and lost several teeth. The lung signs cleared materially, altho he has taken little treatment since the salivation and disappearance of symptoms. The x-ray films (Figs. 4, 5, 6) show the condition before and after treatment. During the last two months, altho apparently well, he has received six full doses of arsphenamine in an effort to obtain a negative Wassermann test. He showed no reaction to any of these injections.

Case V. Mrs. V., colored, aged 39. Complaint: shortness of breath, violent cough and weakness. P. H.—Has had three husbands during the last 21 years. Two children, ages 18 and 20, living and well. Vaginal ulcer 17 years ago. Three miscarriages; first one fifteen years ago, and last one 2 years ago—all about the fourth month. In 1919 had a deep ulcer in the roof of mouth which lasted several months.

P. I.—Began in April, 1920, with a hard, dry cough, which later became productive. Soon began to wheeze and complain of shortness of breath, which grew steadily worse. Lost 15 pounds in weight and had slight fever by spells. During coughing spells often had sharp, stabbing pain at base of right lung extending through to back. Had several sudden suffocative attacks and was treated for asthma for some months by several physicians. By September, 1920, when she entered the Glockner Hospital, she had to sit up all the time and was often gasping for breath and very weak. She raised considerable thick yellow sputum which was always negative for tubercle bacilli. Marked inspiratory and expiratory dyspnoea were present.

P. E.—Lungs showed impaired resonance over the right side, especially posteriorly. Breath sounds were very distant and practically absent at times over the upper portion

of the right lung but clear and distinct over the left side. Vocal fremitus much diminished over right upper. There were many squeaks and rhonchi on the right side and some over the left base in front, but no fine rales. No palpable cervical glands. Reflexes active. Eyes react normally.

B. P.—190 systolic, 120 diastolic. Heart, normal position and slightly enlarged. Second aortic sound accentuated. No murmurs. Pulse 100. T. 98.4. Urine negative. Hb. 80%. Total leucocytus, 9,000. Polys. 51%. No eosinophiles. Wassermann test positive. X-ray lungs (Fig. 7) shows ragged increased density outside the right hilus with considerable fibrosis on the upper half of the right lung. X-ray tibiae show marked thickening of periosteum.

Diagnosis—Syphilitic tracheo-bronchial stenosis.

Treatment—Bichloride of mercury and potassium iodide were given in increasing doses with very rapid improvement in symptoms and signs.

At the present time patient is short of breath only if she walks fast or far. Has gained much weight and strength. Does not cough, but raises a little clear sputum in the morning. Breathes easily and noiselessly. Breath sounds are very clear and distinct over both lungs. Vocal fremitus is normal and there are no rales or rhonchi in either lung. Wassermann is a weak negative.

Recent x-ray of lungs (Fig. 8) shows marked clearing of pathological densities.

COMMENT: Cases of syphilis of the lung will not be such a rarity when physicians generally recognize the possibility. All cases with lung symptoms or signs without tubercle bacilli in the sputum who do not do well under sanatorium regime should be investigated for syphilis. Points in the diagnosis are the history of exposure or infection, or of luetic symptoms, the presence of other leutic lesions in the body, especially arterial changes and thickening of periosteum of the long bones, a positive Wassermann test and the results of treatment. Or course, syphilis and tuberculosis may, and frequently do, co-exist in the same patient. In our experience 6% of the cases of pulmonary tuberculosis also have syphilis.

DESCRIPTION OF PLATES

Fig. 1. *Aspergillosis*.

Case I. Very slight radiographic findings with marked physical findings.

Fig. 2. *Blastomycosis*.

Case II. Radiographic findings greatly in excess of physical findings. Diffuse, irregular, coalescing densities, somewhat resembling an acute tuberculosis.

Fig. 3. *Streptothricosis*.

Case III. Total density of left hemithorax, with no lung markings. Density of right apex.

Fig. 4. *Syphilis*.

Case IV. Diffuse density of right side of chest, with an irregular, ragged density, continuous with heart border. Radiograph made in October, 1919.

Fig. 5.

Case IV. Same as Fig. 4, taken Feb. 24, 1920, showing partial resolution of the irregular infiltration and the upper lobe density.

Fig. 6.

Case IV. Same as Figs. 4 and 5 taken Feb. 17, 1921. Complete resolution of the irregular basal densities, with linear fibrosis in the upper lobe.

Fig. 7. *Syphilis*.

Case V. Ragged density at right hilus, with fibrosis in upper right lobe. Radiograph taken Aug. 28, 1920.

Fig. 8.

Case V. Same as Fig. 7. Taken Jan. 22, 1921, showing marked clearing of pathological densities after specific treatment.

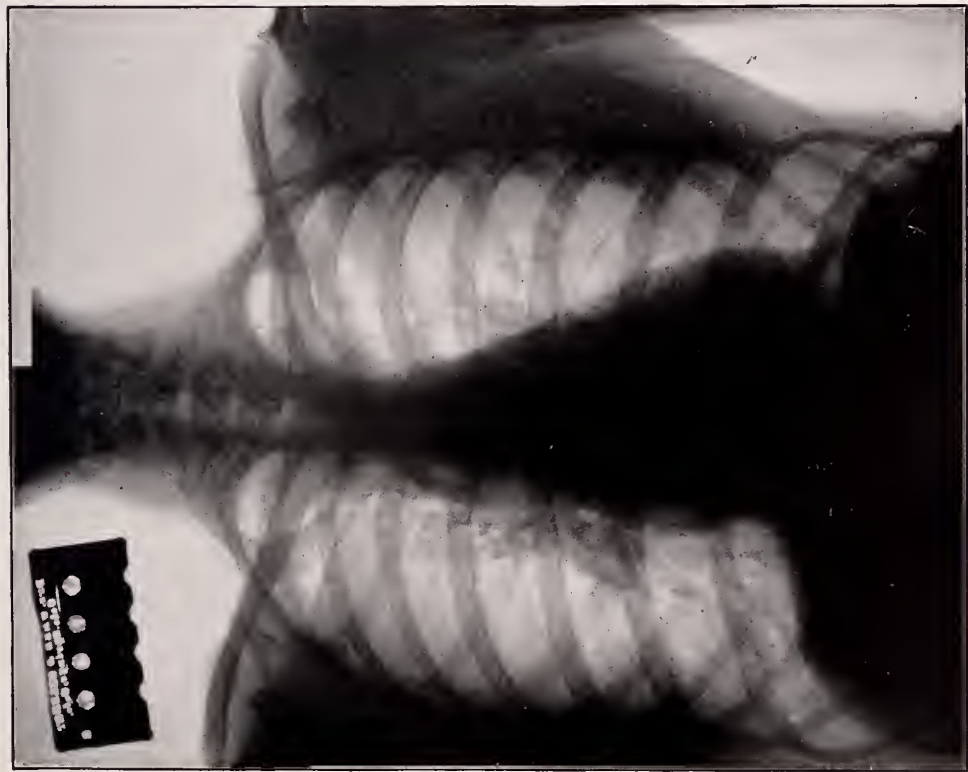


Fig. 1. *Aspergillus*.

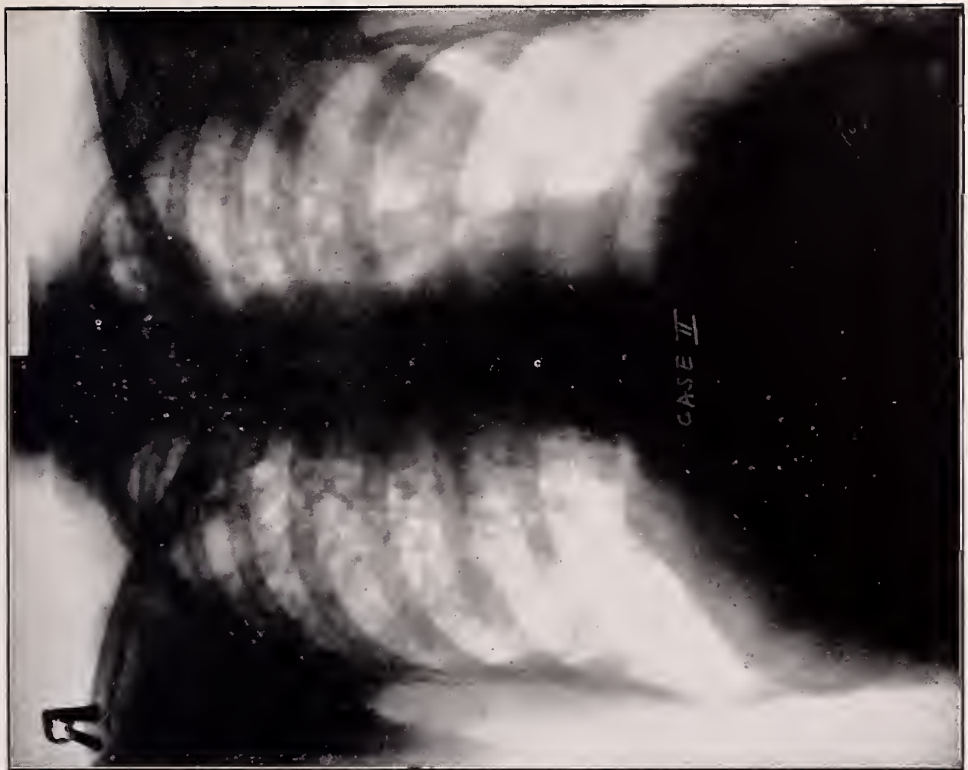


Fig. 2. *Blastomycosis*.

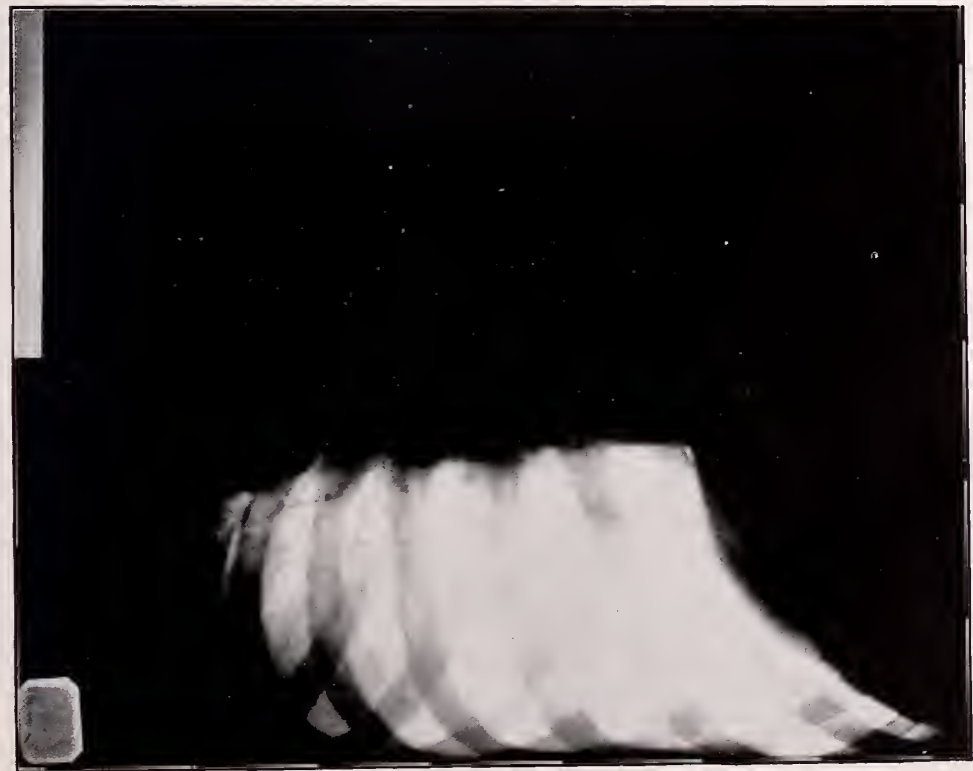


Fig. 3. *Streptothricosis*.

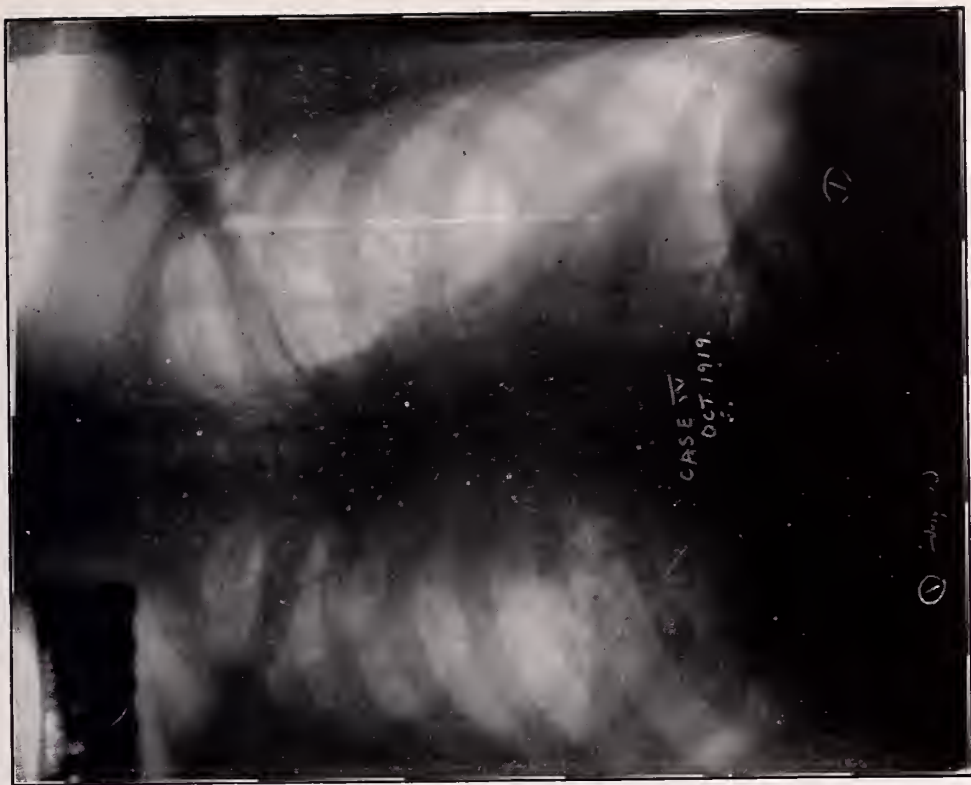


Fig. 4. *Syphilis*.



Fig. 5.



Fig. 6.

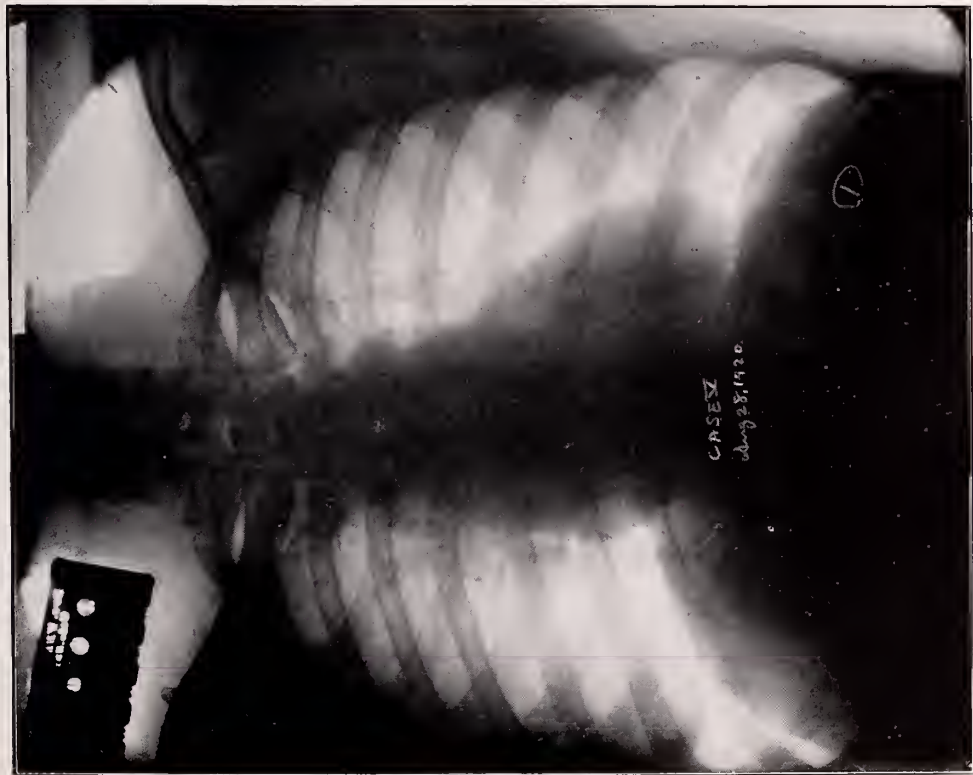


Fig. 7. *Syphilis.*



Fig. 8.

CONCERNING RADIATION IN PELVIC CANCER *

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Medical literature is not at all unanimous in its conclusions as to the exact status of radiation in pelvic cancer, and this is the writer's excuse for presenting certain impressions gained from his long experience in this work, as well as those based on his observations in many clinics.

European operators, particularly English, French, Scandinavian and German, have, up to the present time, been much more active, if not further advanced, in this work than American physicians. Our foreign confreres on the whole give more favorable case reports than observers at home.

It will scarcely be necessary to go into the biologic effect of radiation, as this is no doubt familiar to you all. We will accept the theory that certain ineffectual radiation may act as a stimulus to a cancer cell, and, under favorable circumstances, actually promote the growth of these cells; yet, in so far as the writer knows, there are no authentic cases on record which prove the truth of this belief. There can be no question that such disasters may occur, but, conversely, there is neither any doubt that a more intense or prolonged radiation not only inhibits but actually destroys, primarily, the nucleus and, secondarily, the body of any aberrant or malignant cell that is so exposed.

The rationale of radiation is to study individually each case submitted for treatment and to apply to that case the particular amount of ray energy that will best cope with the condition present. There are well-defined indications to cover specific cell lesions where definite results may be confidently expected, in a more or less limited group of cases.

It is my desire to make it clear that in this paper I shall not discuss surgical treatment in any detail but will refer to

it solely from the viewpoint of the radiologist, who has had ample opportunity to study end results and work out conclusions with competent surgeons.

All cases which are favorable operative risks should, of course, be given the benefit of the best surgical skill available. In cases, however, where an operation is not feasible, sufficient evidence has been collected to say justly that there is now no longer any excuse for withholding radiation. Further, I am willing to assert that cancer of the uterus, advanced to a point where diagnosis is unmistakable, is practically incurable by any means in our present armamentarium, and that includes surgery. On the other hand, the most advanced carcinoma of the uterus can be distinctly and materially benefited by radiation, in so far as inhibition of distressing symptoms are concerned.

Borderline cases should be given radiation and treated as if dealing with carcinoma.

In carcinoma of the cervix, I believe it is possible to effect a cure in a certain proportion of cases. Our object in dealing with cervical carcinoma should be to destroy every malignant cell with radium, as quickly as possible. If this is done before the glandular channels have been invaded, there is fair prospect of a cure.

My technique for a cervical carcinoma usually consists of an implantation in the cervix of 50 milligrams of radium element, with filter of one-half millimeter of silver, one millimeter of brass and one millimeter of hard rubber, for fifteen hours, giving four such applications within six days' time. This is a total of three thousand milligram hours, which is sufficient to destroy carcinomatous cells within a radius of three centimeters in all directions from the center of application. This treatment is followed by x-radiation over the

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lower abdomen, through four ports of entry, giving a total of six hundred milliamperere-minutes in a period of six days.

In cancer of the body of the uterus, the technique is practically the same, except that radium is carried up to the fundus, if possible. If this cannot be accomplished, radium is packed in an additional two millimeters of hard rubber filter, the rectal wall is protected with two millimeters of lead, and the entire mass inserted into the posterior cul de sac, additional tubes are placed in each fornix, and the exposure carried up to six thousand milligram hours within six days' time. The x-ray cross-fire is directed through six ports of entry on the abdomen, giving a total of 900 milliamperere-minutes with ten millimeters aluminum filter, $\frac{1}{2}$ -inch cotton filter, under compression, one hundred kilovolts, five milliamperere tube circuit, at an eight-inch skin distance.

The European operators are using a much more radical procedure. They have perfected transformers, claimed to develop two hundred kilo-volts, and with especially designed hot cathode, and water-cooled tubes obtain a high degree of gamma-radiation. The patients are subjected to many hours' treatment, and suffer great bodily discomfort, frequently exceeding the shock of prolonged surgical operations, but actual cures are recorded.

If one is to accept reports emanating from some of these radiation centers, it

is apparent that a great step forward in the treatment of uterine malignancies has been accomplished. American engineers are busy now developing similar apparatus, which, in a reasonably short time, it is hoped will be available to the American radiologists.

With reference to malignant conditions, the whole question of operability is indeed a grave one. This is especially emphasized by the fact that consent to operative procedure is not now so readily given by the surgeons who formerly operated quite freely, upon cases under discussion.

The writer believes that thermic coagulation and electrical dessication will largely supplant the knife in borderline and clearly operative cervical cases. If one can be sure that the growth is confined wholly to the uterus, a careful hysterectomy is the proper procedure. In such cases the surgeon and the radiologist should cooperate.

Let us urge, whenever possible, a routine procedure along these lines. The radiologist makes an intra-uterine pre-operative radium application. The surgeon operates from five to seven days later, and the radiologist follows the operation immediately with radium in the vagina, x-ray over the abdomen in the usual post-operative method. In the belief of the writer, such a procedure is the best combination that we have at the present time to combat uterine malignancy.

THE TUBERCULAR (Pulmonary) AS A SURGICAL RISK*

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Calot's dictum, "Le bistouri, c'est l'ennemi"¹ of the surgical tubercular would seem to challenge all surgeons operating tuberculars.

Quite the opposite thought came from W. W. Keen in 1906, when he said that, "surgeons have not been very active in what I regard as the most magnificent crusade of the last ten years, the crusade against the great white plague * *. It has been chiefly by the physicians. We surgeons have been derelict in our duty because we have not come to their help in the matter of surgical tuberculosis as we should have done."² The prodigality of the literature covering every phase of the surgical study of hyperthyroidism as compared to the paucity of literature on the tubercular as a surgical risk, would indicate that the words of Keen had fallen upon stony ground.

In comparing the tubercular who requires surgery with the case of hyperthyroidism who can be relieved only by surgery, I have not chosen that which by comparison is, "irrelevant, immaterial, and not pertaining to the question"; in fact, I go so far as to predict that our latest laboratory apparatus,—the metabolism measure,—will, if applied with the same assiduity and zeal to the study of the tubercular, reveal an interesting comparison in the two types of toxicosis. Again, as thyrotoxicosis by reason of its extra-hazardous effect has spurred the profession to evolve a most scientific exactitude combined with the highest surgical skill in dealing with it, so in turn, should the surgical tubercular with equal right share in the application of these scientific attainments.

For those of us who practice medicine and surgery in the Southwest, conditions are changing. Osler said in 1912,³ in speaking of the climatic treatment of tuberculosis, "among high alti-

tudes in the United States, the Colorado resorts are the most important. Of others, those in Arizona and New Mexico have been growing rapidly." The tubercular has been seeking a "cure" in the new Southwest for over two decades. With the end of the world war, the United States found herself with 70,000 tuberculars to care for. Thousands of these ex-soldiers are now "chasing the cure" in that region whose reputation for "cures" is "growing rapidly." Thus the whole southwest is becoming known as a resort; the smallest villages, and the outlying ranches are being occupied by tuberculars. This influx of tuberculars has imposed and will continue to impose upon the profession of the Southwest a special knowledge of this disease, and it is incumbent upon us to "be prepared" and to measure up to every requirement of the tubercular's multifarious medical and surgical needs.

For the purpose of this paper, by "tubercular" will be understood the arrested, quiescent and active cases of pulmonary tuberculosis.

We do not include cases of extensive activity, for while these may and frequently do require surgery, which they will receive when it is sufficiently urgent, their lung condition being very probably hopeless, the ultimate result will be death from pulmonary tuberculosis regardless of the surgery. To this latter class, however, when operated, will be applied all the principles of safety promulgated for the first group.

What are the factors which determine the risk in the tubercular? They are exactly those which determine the risk in any operative case, plus a chronic mixed infection of the lungs. As anesthesia of some form is necessary to render every patient operable, it follows that inhalation anesthesia, when used, must be an important factor in

*Read before the joint meeting of The Medical and Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society, at Phoenix, Arizona, December 2, 1921.

prognosis where latent, acute or chronic infection of the lungs exists. Leonard Freeman, of Denver,⁵ has observed that the lungs may be of more importance than the heart in determining the surgical risk.

F. H. McMechen,¹⁶ presumably voicing the opinion of the National Anesthesia Research Society in his address before the Chicago Medical Society in October, argues that, "Because fatalities still occur with undiminished regularity, under both local and general anesthesia, even in the practice of the most experienced surgeons and anesthesiologists, it becomes vitally necessary to formulate some routine plan by means of which not only the patient's fitness to take an anesthetic may be determined in advance, but also, and more especially how anesthesia may be given with the utmost safety to such hazardous risks." The work of this society is along helpful lines; they can even now report progress; we hope to gather much of value concerning the tubercular in their future reports.

From our review of the literature we deduce that there are three schools concerning the anesthesia of choice in operating tuberculars: (1) Those using ether or some combination of it; (2) those using nitrous oxide gas and oxygen; (3) those using local, regional and spinal anesthesia. There are most excellent men, experienced operators and anesthesiologists in each school, each reporting success, each pointing out the failures and dangers of the other two, all with their mortality. It would seem that in reviewing these criticisms and objections, that most of them had been made from personal observations, rather than by observation coupled with a scientific laboratory and post-mortem check on man and animals. It is this seeking after the truth concerning the operative tubercular and all forms of anesthesia that we would urge upon all those having access to experimental laboratories. The truth, when found, shall free us from the traditions of our profession and the laity concerning the "tubercular and anesthesia," and give us a rational basis for a choice of anesthetics in these cases. The work of

E. Zueblin,⁷ J. B. Rogers, and others, is along the right line, but there remains yet so much to be accomplished.

ETHER ANESTHESIA

It is worthy of note that the first patient operated upon under ether anesthesia was a "man tall and feeble, with tubercular heredity." Since October, 1846, surgeons have been operating tuberculars under ether. Those who are satisfied with the results of this method may be said to have achieved their success through three factors: First, a careful examination and selection of cases; second, an expeditious, adaptable operative technique; and, third, skillful anesthesia. These three are indispensable to success; the inability to apply all of them explains an upward mortality curve, and is responsible for continued search after methods. We know a surgeon operating largely upon tuberculars, who requires that they be given a careful physical and x-ray examination before operation, and another six weeks after operation. It is his opinion that ether, when properly administered, is not detrimental to tubercular cases. His opinion is concurred in by a considerable number of excellent surgeons. There are others like Hedblom⁸ who admit that "tuberculous patients are relatively poor operative risks." Witherhill, of Denver,⁹ in discussing pulmonary and cardiac sub-standard risks, operated under ether, said: "I should never refuse an invalid a necessary surgical operation because he happened to have a heart lesion, or even advanced pulmonary tuberculosis." There are men like Archibald, Ochsner, De Costa, Leonard Freeman, and others who believe that ether is responsible for activation; others who hold it responsible for pulmonary hemorrhages, recent and remote, as well as being the cause of pneumonia and various organic parenchymatous degenerations.

ETHER OIL COLONIC ANESTHESIA

Realizing the limitations of ether anesthesia in pulmonary troubles, many began looking for safer modifications and combinations. The possible advantages of ether colonic administration in

the presence of latent bronchial and pulmonary inflammations was suggested by ⁹Dr. L. W. Bacon in 1906. Experimental work had been done before this, but the real progress in the United States will be associated with the names of Sutton, Gwathmey, Baskerville, Wallace and Lathrop. They have perfected a technique of administration whereby the "synergistic action of drugs"¹¹ employed gives the desired anesthesia. Lathrop¹⁰ states: "The value is undoubted in cases in which absorption must be minimized on account of some lung, heart or kidney lesion." Again, that, "Wallace made a study for one hour, by sphymographic tracing, of a number of animals under ether-oil anesthesia during which the pulse and respiratory tracings never varied. This fact has been well demonstrated in many hundreds of patients surgically anesthetized by this method, in whom without any supplementary anesthetic, the pulse, respiration, reflexes and blood pressure all remained constant." Gwathmey, in discussing Lathrop's paper, said: "It is one of the safest methods. The margin between full surgical anesthesia and a toxic dose is greater than with any inhalation method. It is one of the most pleasant methods for the patient, as attested by the fact that those who have tried other methods prefer the colonic. A greater relaxation of the musculature exists than is usual with any inhalation anesthetic. A smaller amount of ether per hour is required than by any other method. The estimated amount is two ounces per hour, which seldom varies. An anesthesia deep at one time and light at another, is physiologically impossible. The brain is more completely protected against stimuli than by any method of inhalation anesthesia." Like all new methods, ether-oil colonic anesthesia is not always a success in the hands of the novice. Our experience with the method, especially in abdominal work in tuberculars, has not given that degree of relaxation so greatly desired, but we can bear witness to the small amount of ether required, and if this "exhalation" anesthesia shall be proven devoid of injury to the lungs and other organs, we shall endeavor to

perfect our methods of administration and operative technique and adapt them to selected cases of pulmonary tuberculosis.

NITROUS OXIDE OXYGEN ANESTHESIA

Nitrous oxide anesthesia had its inception in obstretical, dental and other short operations. Gradually it began to be applied to sub-standard risks; its popularity here has made it the frequent anesthetic of choice in operations upon tuberculars.

Probably the best known exponent and investigator of nitrous oxide oxygen analgesia, is Crile of Cleveland. The profession will ever be indebted to him for his scientific and painstaking researches in the nature, causation, prevention, and control of surgical shock. He states¹² that, "in our clinic we first employed nitrous oxide oxygen analgesia for bad risk cases of exophthalmic goiter, and have gradually extended its use to bad risk cases of all kinds, until now it is employed in approximately 90 per cent of all our cases. We have been collaborating with members of the anesthetic staff in our endeavor to perfect the technique of administration of analgesia as the greatest aid to surgery of which we can at the present time conceive, since by means of it the patient undergoes a pleasant experience and a shockless operation, and above all, because he passes through the operation with his internal respiration unimpaired, but with all his factors of safety undiminished." In lung surgery per se, Gwathmey's¹³ conclusion in the A. E. F., was to the effect that the choice lay between ether and nitrous oxide. He further stated that full surgical anesthesia, which is "safe without preliminary medication, is unsafe following preliminary medication," to our mind a very important observation. These remarks need not be considered as contradicting his more recent views as previously quoted concerning ether oil colonic anesthesia, but rather as an observation in lung surgery in war. How the objections of "preliminary medication" have been surmounted, he presents in the *Annals of Surgery* for August. "Morphine and magnesium

sulphate synergistically used give good relaxation when supplemented by (a) nitrous oxide oxygen to abolish consciousness and for its added analgesic effect; (b) or by using a local analgesic for the skin and peritoneum."

J. T. Halsey,¹⁴ of Tulane University, believes that nitrous oxide anesthesia should be used whenever possible in all tuberculosis cases as a precaution against lighting up or aggravating pulmonary lesions, which is a real danger if ether is used.

Archibald, of Montreal,¹⁵ who has probably operated more pulmonary tuberculars than any other surgeon in America, has some very excellent ideas concerning the anesthetic. "First, it is important to choose an anesthetic that will do the least harm to the lungs. Gas oxygen undoubtedly fulfills best this requirement; morphine and atropin are given half an hour previous to operation, and novocain is freely used to help out the gas."

The author has analyzed the operative results with regard to the effect of the anesthetic upon the lung condition, and has found that in the few cases, eight or ten, where ether was used, there was a much higher percentage of anesthetic ill effects than with gas-oxygen. Indeed, the latter, in his experience, never has any obvious immediate effect on the lungs.

While it is obviously necessary to avoid the irritating effects of ether upon the pulmonary mucosa, one should also remember that the rapid and deep respiratory movements of induction, as also any violent exertion of the patients on the operating table, must be equally avoided.

Undue physical exertion is bad for a tuberculous lung. Consequently, the author does not hesitate to ask the anesthetist to add sufficient chloroform to the gas-oxygen to get the patient quiet. "I have lately come to the conclusion, having regard to the somewhat forced respiration which is frequently seen during the induction of gas-oxygen anesthesia, that it would be better to begin the anesthesia with chloroform, administered very slowly and quietly, and then to continue with gas-oxygen

as soon as the patient has passed the stage of excitement. In any case, the quietest anesthesia possible is essential. Chloroform throughout is not advised."

LOCAL ANESTHESIA

Allen, in his work, "Local Anesthesia,"¹⁷ cogitates upon general anesthesia versus local anesthesia, thus: "Had the position been reversed and local anesthesia been discovered first, general anesthesia might now be struggling to displace it from its pedestal, and it is not to be doubted but that local anesthesia would have reached a much higher plane of development, for in all operations it is suited to safety and comfort." Professor Matas, writing the introduction to Allen's work, speaking of general versus local anesthesia, says: "The problem of shock, the secondary nausea, and vomiting, the pulmonary complications, embolism and thrombosis, and above all, the degenerative auto-intoxications following the action of these somatic poisons on the eliminating and other organs still remains to be reckoned with * * *. Combinations of novocain and adrenalin in various isotonic dilutions—by practically eliminating the toxicity of the analgesic, increasing its stability, durability and intensity—have so expanded the technique that in the hand of an expert, peripheral analgesia may be made to encompass in its grasp almost the entire domain of operative surgery."

Bartlett,¹⁸ in a very fair summary of indications for local anesthesia, says: "The indications for local anesthesia are far from universal. It depends, first of all, upon the ability and inclination of the surgeon, to say nothing of the condition and attitude of the patient, as well as his age, race, training, and intelligence, all of which must be taken into consideration. Local anesthesia may be reasonably considered indicated in obstructive conditions of the air passages, inflammatory respiratory trouble, circulatory decompensation, acute abdominal emergencies, renal insufficiency, toxic conditions (goiter, etc.), chronic alcoholism, marked obesity, and very old age. The same is true

if a general anesthetic has been used in the very recent past, and if the patient must for any reason become ambulatory immediately after the operation."

REGIONAL ANESTHESIA

In this type of anesthesia the nerve blocking solutions are applied as nearly as possible to the origin of the nerve, or along the nerve trunk. Obviously there are many objections to this method, but as developed and practised by Professor Victor Pauchet, and advocated by Sherwood-Dunn,¹⁹ doubtless it has a limited field in the hands of the expert.

SPINAL ANESTHESIA

This may be considered as a type of regional anesthesia, and while applicable to certain cases, has its distinct limitations in the tubercular. We did a little experimental work with this method in 1901, revived it again in 1904, allowed it to lapse, again revived it in 1920, but we never have acquired the confidence in the method so desirable in a safe anesthetic. A. S. Boyd and Carl C. Yount²⁵ have reported 6,229 operations with only four deaths, and one surgeon in New Orleans has had over 6,000 cases with only one death.

Dr. Oscar M. Schere, who has had much experience in operating tuberculars in one of the Denver sanatoria, speaking of their chest surgery, says: "All of their operative work was done under spinal anesthesia, since their medical staff was opposed to the use of general anesthesia in these patients."

However, in the tubercular who is ever prone to that insidious complication, tubercular meningitis, headache and other centric disturbances, coming on from a few hours to five days after spinal analgesia, give the surgeon considerable cause for worry until the conditions disappear. Yet he who is master of the technique, need have no unnecessary apprehensions. It should also be borne in mind that the tubercular presents a local respiratory handicap, and should the anesthetic solution course so high as to involve the respiratory centers, we would have a most trying "ac-

cident" to deal with. When you let go of the plunger, you let go of your hold upon this type of anesthetic. Thereafter you must be able to direct its course by posture.

In the classification of surgical and anesthetic risks, we again quote Mc-Mechen: "In the present advanced state of surgical and anesthetic knowledge, the patient has a right to expect a fairly exact preoperative diagnosis, and a very exact preoperative prognosis. Skill in prognosis can only be gained by experience. The surgeons and anesthetists who make and record preoperative prognoses, and check them up with their results, will soon learn that the patient's physio-pathological condition, or reserve vitality, is the paramount factor in recovery.

A. H. Miller, of Providence, R. I., has classified operative surgical risks as follows:

A.—*Good Risks*: Patients free from organic disease, whose condition is not likely to prove fatal.

B.—*Fair Risks*: Patients suffering from organic disease, whose surgical condition is not especially serious.

C.—*Poor Risks*: Patients whose surgical condition is so serious, or so far advanced as likely to result fatally.

We would add a "D" class to cover many of our tuberculars—very poor risks—patients suffering from extensive organic disease where the surgical condition is especially serious.

The scope of this paper will not permit of a discussion of tubercular risks under regional surgery; that indeed would require a thesis in itself; but in passing we desire to call your attention briefly to the wonderful advances made in surgery of the chest during the war, and so successfully practiced since, in America by Willy Meyer, Archibald, Hedblom, and others. We note the lessened mortality when operating under positive pressure.²² Hedblom's²³ timely conclusions concerning empyema must not be omitted. "The recognition of tuberculous empyema was often difficult. A history of a primary pleurisy with effusion seemed more often to signify a tuberculous condition

than did a pulmonary lesion, unless the latter was active and extensive. A tuberculous empyema might be present in the absence of clinical or x-ray evidence of pulmonary involvement. The typical microscopic picture in the sectional pleura, or the demonstration of the bacilli in the exudate might constitute the only evidence in such cases. A tuberculous empyema not secondarily infected should not be drained, and should be aspirated only for a considerable accumulation of fluid. For a tuberculous empyema secondarily infected, either by operation or spontaneously, drainage was necessary. In the absence of bronchial fistulas and bleeding, secondarily infected tuberculous empyema might be markedly benefited by antiseptic solution treatment. The amount of fibrosis or other pathological change in the lung in such cases determined the degree of expansion of the lung, whether following antiseptic solution treatment or decortication. If the lung failed to expand in whole or in part, a several-stage operation designed to collapse the chest wall was indicated. Tuberculous patients were relatively poor operative risks."

The use of the x-ray for diagnosis in intestinal tuberculosis has made rapid progress; its routine use should be practiced; better diagnoses will then be made, and embarrassing situations at operations minimized.

Since the war, those of us working in Prescott have operated 150 cases who were tubercular, covering fairly well the range of general surgery. The anesthesia was distributed as follows:

Gas oxygen	16
Ether inhalation	19
Ether oil colonic.....	43
Spinal	25
Local	47

We have endeavored to surround these sub-standard risks with every safeguard. We have constantly endeavored to adapt the anesthetic and the operation to the patient and ourselves. We have no optimum method. Our experience is to the effect that nitrousoxide oxygen preceded by local anesthesia, with a slight ether sequence where absolutely necessary, as advo-

cated by Crile, is the best suited to most of these cases. We believe that where it is possible, operations should be done under local anesthesia. In certain carefully selected cases, spinal anesthesia may prove of great value. Ether-oil colonic anesthesia requires more clinical and laboratory proof of its safety in tuberculosis, though in our limited experience (43 cases) we have seen no untoward effects upon the lungs or intestines.

The following points may be of service, when considering operation upon tuberculars:

1. Except in most urgent cases the history must be taken, and that part pertaining to the respiratory system developed to the fullest. The clinical picture of this risk must be brought up to date, and the previous damage of this disease must be known and rated.

2. We should elect to operate during a period of improvement,²⁴ endeavoring to secure this desideratum by approved methods in cooperation with the internist.

3. Clinical preparation—study of the temperature and pulse, x-ray, blood count and haemoglobin, urine examination, Wassermann, and blood pressure—should be made. The record of vital capacity and results of breath holding test will prove of value.

4. Team work is quite as much needed here as in the thyrotoxic cases. The internist, anesthetist, surgeon, assistants, and nurses in charge must work with intelligent cooperation before, during and after the operation.

5. The operating room should be kept at the proper temperature, no chilling of the patient should be permitted in the operating room or corridors. All the appliances for dealing with shock, and the accidents of anesthesia should be at hand and should be immediately serviceable.

6. The anesthetic should be that one, which after a careful estimation of the tubercular risk in consultation, offers the greatest advantages to the patient. (Note—In our sparsely settled districts, we often find it necessary to use the anesthetic which our anesthetist is most competent to administer.)

7. The pre and post-operative care of the patient should not be left to the general nurse, but he should be specialized by a nurse of the highest intelligence, surgical training, and fidelity.

8. The internist, anesthetist, or surgeon who has not time to determine the degree of risk and prepare to safeguard his patient accordingly, has no moral right to present for operation, anesthetize, or operate upon pulmonary tuberculars, when there are those available who will take time to safeguard these sub-standard risks.

In conclusion, we believe that it is up to the general practitioner to be able to recognize early those conditions which arise as truly surgical conditions in the tubercular, and to know that because his patient is a tubercular that he is not always to be deprived of the relief surgery would afford his non-tubercular patient. It is equally imperative that the tuberculosis specialist know these facts and more. To the surgeon must come the knowledge that the "poor risk" tubercular may be made a safer risk by careful and painstaking study, planning the operation for the patient, and not sacrificing the patient to an immutable technique. Finally, the profession must realize, as Samuel Robinson has pointed out, that:⁴ "It is not until a balance has been reached between the internist's conservative lack of faith and the surgeon's sometimes dangerous leaning to experimental surgery, that progress occurs in the treatment of conditions which are acknowledged to be beyond cure by medication alone." I submit that this progress has come to the thyrotoxic case, and its principles, if applied generally by surgeons, will result in lessening the risk in the tubercular, and the "internist's conservative lack of faith" will be supplanted by a wholesome confidence in the possibilities of well directed surgery.

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SOME SIGNIFICANT PROBLEMS IN ANTI-TUBERCULOSIS WORK*

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The tuberculosis problem is not yet solved, nor apparently is it nearing solution. Notwithstanding the vast sums spent in the construction and maintenance of sanatoria, the large amounts of money and effort spent in popular education, the extensive propaganda carried on by all Anti-Tuberculosis organizations, the increased attention paid to this subject in the medical schools and in medical literature, and in the post-graduate courses for physicians, both at the sanatoria and independent of sanatoria, the death rate has not materially decreased, and the optimism of physicians and social workers so manifest two decades ago, has, to say the least, been much moderated. The hopeful attitude of the workers of that period is now seen, perhaps unfortunately, most frequently in the beginner and in the inexperienced. Our united efforts have not been entirely, however, without results. They have served to properly outline the problem—to bring its colossal size into true relief. We are beginning at least to realize its true magnitude, but we cannot as yet say it is solved.

In 1905, at the first meeting of the National Association for the Study and Prevention of Tuberculosis, now known as the National Tuberculosis Association, Dr. William H. Baldwin, in a most comprehensive article, called attention to the fact that there were, including some not yet constructed but assured, 135 institutions, both new and old, where tuberculous patients were cared for in the United States and Canada. In all, there were accommodations for 8,400 patients, of which 30% were in New York State alone. So enthusiastic were tuberculosis workers in those days that the construction of permanent sanatoria was considered inadvisable, since it was generally conceded that the disease would soon be eradicated. The

budget for the National Association in 1905 was a little more than \$10,000, and of all agencies engaged in Anti-Tuberculosis work approximately \$100,000. I have been unable to secure satisfactory data on the number of beds available for tuberculosis patients in the United States and Canada at the present time. In the 1916 Director, however, is listed more than 3,100 different organizations and institutions engaged to a greater or less extent in Anti-Tuberculosis work. The budget of the National Association of last year alone was \$180,000 and the budget for all Anti-Tuberculosis work in the United States exceeded \$2,500,000. Every state has some form of organization to fight tuberculosis, as well as has every large city and many smaller centers.

The literature of the early periods abounded in articles advocating the establishment of sanatoria, the education of the physician, and the education of the laity. The "Winning Fight" was a very popular title presented on many occasions. Trudeau stated at a meeting of the National Association that there was a vast and great need for the education of the people, and through them the education of the state. He said: "It is evident that if every man and woman in the United States were familiar with the main facts relating to the manner in which tuberculosis is communicated, and the simple measures necessary for their protection, not only might we reasonably expect as a direct result of this knowledge a great diminution in the death rate of the disease, but the people would soon demand and easily obtain effective legislation for its prevention and control."

At the present time we have such articles as, "Is the Sanatorium Worth While?"; "Why the Continued High Death Rate?"; "After the Sanatorium, What?" Farm colonies and industrial

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communities for the tuberculous at the present time are subjects for special investigation. The National Tuberculosis Association workers are attempting at the present time to secure data on the advisability or inadvisability of establishing industrial and agricultural colonies, and the after care of rehabilitating the tuberculous patient. These ideas and movements have thier origin in the fact now becoming recognized, but only recently so, that our Anti-Tuberculosis work is lacking in permanent results.

It is my hope at this time to call attention to a few fundamental factors which seem to me, after some years of experience, to be worthy of more study and careful analysis than many of us have given them—factors which have their basis in the very nature of the disease, and in the psychology of the patient; factors which have to do with the cooperation of the patient with his physician and the proper employment of the opportunities given for his recovery. This is the problem presented by the patient himself. The problem that has for its complete solution proper advice at the proper time, and this thoroughly and properly followed. Absolute control of patients is certainly an essential factor in the work of the physician treating tuberculosis, but how completely can this be done, and how completely is this done. We might consider for a moment the typical individual ordinarily afflicted with pulmonary tuberculosis. He is not the very young nor the very old, but the young adult; not the phlegmatic nor the lazy, but the neurotic and industrious; not the individual accustomed to spend many hours in bed, or in complete relaxation, but the one accustomed to spending many hours in activity with but little relaxation; *i. e.*, the young adult just assuming the responsibilities of life, or reveling in its dissipations. Tuberculous patients are hard workers or hard players, or both, the striving, restless individuals who have done many things and hope to do many more. They are the physical bankrupts, such bankruptcy preparing the soil for the reactivity of the tubercle bacillus, which has, as we

believe at the present time, been present since childhood, but which has at least been held in abeyance. When we consider the abrupt change, the great transformation which we as physicians in most instances are forced to advise in the life of such individuals we begin to realize the practical difficulties in the so-called control of our patients. We advise that a life of activity be changed to one of idleness; a life of motion changed to a quiet life, or life of rest; a life of seeing many people and doing many things changed to a life of seeing few people and doing little or nothing. Add to this the physical fact that the advance of the disease has not been sufficient to force on the individual the desire for rest, and we see the situation which I shall call Problem One, or *the problem of the incipient case*. We now can understand that oft-repeated and too familiar answer of the patient when told by the sanatorium physician that he must go to bed: "Stay in bed! I cannot stay in bed; I am naturally of a nerovus disposition, I must be active. You do not understand, Doctor, how much work I did." The patient does not feel the need of rest. He cannot grasp the fact that if tuberculosis is present the less he feels the need of rest the more effective rest will be taken; the more certain will be his recovery. Too often the physician becomes annoyed. He tells the patient to go his way. The patient becomes dissatisfied with directions given him and goes his way. The physician spends his time with those that are more tractable. The patient goes his way without supervision and without advice. They part company, and the physician feels that his duty has been performed. This, however, by no means solves the problem. Add to the above picture a second phase; one where proper advice is given and followed for a time and satisfactory improvement begun. The case is regarded as a favorable one and will in all probability go on to recovery. The routine, however, becomes irksome; the patient overestimates his ability for activity, disregards the advice he has previously followed, changes his attitude with reference to his physician,

and instead of asking his physician what to do, and trying in every way possible to follow his advice, tells the physician what he, the patient, intends to do. The twain have, as it were, exchanged places. Too frequently our sanatorium patients say to us, "Doctor, I am going to do so and so, what do you think of it?" One can always reply that as a piece of news such communication is interesting, but there can be really no reason for introducing it into a consultation of patient with physician. The decision has already been reached; no advice is asked. It is merely a communication.

It has been urged that cold facts and discouraging figures should not be quoted to early cases or to rapidly improving cases. We should not advise them that after four years 50 to 60 per cent of all cases having positive sputum are dead, and that after twenty years 70 to 80 per cent are dead of their tuberculosis. We should not do this because it destroys the optimism of these patients, and makes them less likely to fight a good fight, without which there will be no victory. It seems to me that something which would operate against the over optimism, certainly unwarranted optimism, in favorable cases might do much to improve the end results, which we all know are notoriously discouraging. Lawrence Brown says: "Many tuberculosis workers have great difficulty in grasping that pulmonary tuberculosis is a chronic disease, which temporarily responds rather easily in many instances to more or less efficient treatment. The patient also cannot grasp this phase of the disease." The physician spends too much of his time in therapeutic effort on the advanced and advancing case, and much too little advice is given the incipient. True it is, that an audience with a favorable case is oftentimes hard to obtain; they are not seeking help—and an audience with a far-advanced case is notoriously easy. The sicker the patient the more welcome the physician.

Problem Two, or the *problem of the unimproved or slightly improved.*

Briefly consider for a moment a typical case; the diagnosis is made at the proper

time and a fully equipped sanatorium is available for treatment; a long residence in such a sanatorium is followed by discharge, improved or slightly improved. The outlook for recovery which was so bright on admission to the institution has undergone a complete change. His optimism has changed to pessimism. He has tried without result the established routine with perhaps special methods of treatment. Is it any wonder that he gathers his slender dollars and pours them into the hands of quacks and charlatans who promise, and oftentimes guarantee results. The propaganda spread broadcast among both physicians and laity that pulmonary tuberculosis is the most easily curable disease has done untold harm. Tuberculosis may be easily curable as an infection, and undoubtedly this is so, but most certainly it is not easily curable when it becomes a definite disease with signs and symptoms.

Problem Three, or the *problem of cases recovering without treatment.*

At first thought we should consider that recovering cases present no problem, but there are certain features regarding such cases that should receive consideration. We have all seen individuals who have disregarded advice or taken improper treatment, and yet recover. Many such instances I consider unfortunate occurrences. They certainly are so if one considers the ultimate aim to be the greatest good to the greatest number, as one so recovering oftentimes goes about giving advice, pointing to his own experience, and by so doing causing the death of many others. Frequently I say, "If a thousand men should jump from a high building perhaps two would escape unhurt. Would these go about and say, this is a perfectly harmless procedure?" Perhaps two of the thousand recover under such conditions as mentioned above. They do the talking and forget the 998 long since silent.

To resume briefly, the insidiousness of the onset of tuberculosis, (for early cases and favorable cases are not sick in the ordinary acceptance of that term); the chronicity of tuberculosis, and length of time necessary for the

patient to remain under supervision; its periods of temporary improvement which produce a feeling of well being and desire for activity not commensurate with ability,—thereby oftentimes paving the way for a relapse,—make the so-called control of the favorable case a most difficult matter. Add to this picture, the picture of the poor unfortunate who fails to improve even with proper treatment and forsakes it because of no results, and then seeks the charlatan who promises results, and by so doing discredits the entire tuberculosis movement, taking with him to his ruin many others who might have been saved. Add to this, further, the individual who secures a good result in spite of no treatment, or improper treatment, not because of it, and yet persists for years in killing his friends by citing his own experience. These, then, are our three problems.

With our enlarged facilities for combatting tuberculosis, with the great increase in the number of beds available for these sufferers, perhaps at least a fractional part of our poor results are due to our inability to secure the co-operation of the patient in making the best possible use of the facilities at our command. The entire matter might well be summed up in the old saying, "When you tell a man to do a thing you are just half done; the next thing is to make him do it." We have many institutions, we have physicians capable and willing to exercise the proper supervision for as long as it is needed, and the retarding factors in many instances are found in the patients themselves.

DISCUSSION

DR. LUCKETT: The author of the paper indicated that the death rate from tuberculosis was not being materially reduced. In Massachusetts they have kept accurate vital statistics for fifty years. There has been a steady decline in the death rate from tuberculosis during that entire period, so that it is now about one-half of what it was fifty years ago. The interesting feature of that record, which bears out the Doctor's statement, is that after their tuberculosis society was formed and became very active in its educational work, the death rate continued to decline in exactly the same way that it had before. In other words, all of the activity conducted in a wholesale

manner in the state apparently had no effect whatever upon the rate of decline.

On the other hand, in Framingham, Mass., for the last four years there has been an intensive health campaign supported partly by the city and partly by the state and largely by the Metropolitan Life Insurance Co. The idea was to conduct a demonstration of what might be done if every individual in a restricted area was reached by intensive, scientific health work. A report which I saw just last week from Framingham indicates that in that four years a marked reduction in death rate and in the incidence of tuberculosis has come about in that town. The chief activity aimed at tuberculosis in this experiment is to reach every individual and to secure what we call a life extension examination; regardless of whether the individual realizes whether he is sick at all, they induce him to take a complete and thorough physical examination. In that way a great many incipient tuberculars are unearthed which were not suspected by the patient and a great many of them have received treatment and been arrested.

There was one other matter that I thought of during the reading of the paper and that is the hereditary factor. That has been the subject of discussion for a great many years, and perhaps I am treading on dangerous ground, but you know "some people rush in" in such matters. Pearson, the foremost statistician in the world, has studied very carefully the correlation factor of tuberculosis. He has compared that with hereditary characteristics which we can accurately measure, such as stature, eye color, hair color—things that are concrete, easily measured and linked up in a hereditary chain, and he has been able to demonstrate that the children of tubercular parents have a higher incidence of tuberculosis, in exactly the same ratio that they inherit eye color from their parents. That has not been carried very far. This objection may be raised, that these children are, of course, exposed. The environment is unfavorable but that has not seemed able to explain the facts that have been brought out. With the information that we have at hand, I believe that when we are consulted by tuberculous individuals as to the advisability of bringing children into the world, that we ought to ing children into the world, that we ought to much danger of their children acquiring tuberculosis as for the general run of children in the community among all individuals, both tuberculous and non-tuberculous. I think we are justified from the statistics we have in going that far at the present time regardless of how we explain the incidence.

DR. PETERS: The longer we treat tuberculosis, the closer association we have with tuberculous individuals, the more we realize the truth of Dr. Giese's statement and the more it comes home to us that tuberculosis is not a curable disease. I believe with Dr. Giese that the pendulum of optimism has swung too far, and that people in the past have been encouraged when they have been told they are tubercular, with the idea of an easy and a quick

cure. I doubt very much if statistics—those lying things—would ever show us cures if the cases that are reported as cures did have it in the beginning. It is like the cancer proposition that the quacks treat. We get many cases of so-called incipient tuberculosis that probably never had clinical tuberculosis at all. It is an easy thing for an x-ray specialist or a man doing chest work, to find an individual who consults him and says he is a little run down in health—that he has tubercles, and make a diagnosis of tuberculosis. That individual is sent to a state sanitarium or private sanitarium, and in six months he is well because he has changed his routine and been put on a sensible diet, and he is better. That individual nine times out of ten did not have tuberculosis.

We have educated the medical profession to the point that they are so afraid they won't diagnosis tuberculosis in the incipient stage, that they are making lungers out of everybody. It is a mistake. I like to have them under observation for a length of time, to be sure I am not telling a tubercular individual to go his way, and later have him break down with chronic tuberculosis; and, on the other hand, I don't believe it is necessary to fill institutions with that kind of individual when he could be kept under observation and given some instructions, and he probably would produce the same results.

When a person reaches the stage where a safe and sound diagnosis of tuberculosis can be made, he is a chronic consumptive. I don't believe there is a medical man living, no matter how well he may be versed in chest diseases, who can make a diagnosis of tuberculosis when it is incipient. When it is possible to diagnose tuberculosis as tuberculosis, it has passed the incipient stage. When it has passed the incipient stage, that individual has reasonable chances for a life for years to come in good degree of health. Dr. Giese is very fortunate; he can talk about these pessimistic statistics because he never had tuberculosis. I hate to think about them but I know they are true.

I hope the time is coming when such methods as they are carrying out at Framingham can be applied to the whole country. It is not a pleasant thought, especially for one with chronic tuberculosis as I have, to feel that we ought all to be eliminated from existence, but nevertheless if we are ever to eliminate tuberculosis as a factor in civilization, we must corral all the consumptives in the world and sidetrack them until they are dead, or they are bacilli free. If we cannot do that, I see little hope of decreasing the morbidity of tuberculosis.

Dr. Luckett spoke of the decrease in death rate. We have decreased the death rate of tuberculosis but God knows whether that is a good thing. We have lifted the morbidity some, and these people are traveling the highways and byways and infecting the coming generations. The trouble with the educational campaigns heretofore conducted by the National Association and the State Associations and

various other tuberculosis organizations, is that they put the cart before the horse. They attempted to teach the active consumptive how to care for himself, but they didn't pay any attention to his family or children. The keynote of success in tuberculosis is keeping infection away from children—that is where the danger lies. When we come down to this question of heredity, I cannot see that Pearson has spelled anything. If you want to come down to eugenics, it would be a delightful thing if we could make human beings—we might produce a race of superhumans. You take a consumptive and let him propagate children and that child naturally is an offspring from an inferior individual, and the child is susceptible to tuberculosis by nature no more so than it is to a thousand and one other ills. The real reason they get tuberculosis is because they are associated closely with active. Of course, they get it; they can't help it. If the good Lord is kind, he gets tubercular meningitis and dies in infancy; if not, he lives and breaks down later on in life when he ought to be producing.

I feel very keenly on this subject and I am not optimistic as to the results. People, as Dr. Giese has pointed out, are too prone to rush into active life when they feel well. It is a mistake for the average consumptive to think he is well when he feels fine. If that individual could be kept under careful supervision for two or three years after he feels well, then we could expect him to live for a number of years and be at least 70 per cent efficient. I tell my patients when I discharge them as arrested cases, if they will consider they are 70 per cent efficient instead of 170 per cent, maybe they will live; I don't know.

DR. HARRIS: I think Dr. Giese has stressed the biggest factor in the tuberculosis problem, and that is cooperation between the physician and the patient, if we can only find some means of making the patient do as we wish, as we advise him. Our percentage of relapses runs somewhere about 40 per cent—between 38 and 40 per cent. That means that two out of every five patients who were discharged as recovered, with wage-earning capacity, broke down, usually within a couple of years, and I think the biggest factor in bringing about this enormous percentage of relapses is the lack of intelligent cooperation between the patient and his physician. If we could only keep them under our thumbs, as Dr. Peters suggests, for at least two years after active symptoms have subsided, I think our net result would be a good deal better.

DR. GIESE: I thought perhaps someone was going to ask me how we could overcome these problems. A great many years ago I remember hearing a very famous man, Senator Tillman of South Carolina, talking about the problem of the colored man in the south, and outlining very definitely what the white man was going to do, what he had done, and what he intended to do, and when asked what should be done, he said, "I can tell you nothing."

It seems to me these things that I have mentioned are absolutely inherent in the nature of the disease and in the nature of the people having the disease, and they are things that I doubt very much if we are going to make any better. I don't want you to feel that I am always so pessimistic about the future but we have had in Colorado Springs during the last few years some very interesting statistics. Of all the institutions of the United States which can follow their patients most successfully, the Modern Woodmen perhaps is situated most advantageously. They know whether their patients are living or dead and what they are doing in about 98 per cent of the cases. These facts that I mentioned about cases dying were largely from that institution.

They found that of all their patients having tubercle bacilli in their sputum, after four years 60 to 65 per cent were dead. Now if that is true of patients having from six to nine months' proper sanatorium treatment, you can easily imagine what it would be in patients who do not have sanatorium treatment.

I keep away from the feature of not being able to take treatment. It is useless to advise a patient to go to a sanatorium when there is no sanatorium available. They cannot pay for it and there is no free one available. That, of course, decreases the number of cases that should be under treatment. The point I wish to stress is this—that with the facilities at our command, the sanatorium and men capable of treating tuberculosis, etc., we are not securing as good results as we should secure.

The key to the whole situation was brought out by Dr. Peters when he said that as far as we know now, when clinical tuberculosis develops, we have then a chronic disease which may or may not partially recover but which certainly will not recover without a long period of treatment. The only thing, then, that can be done is to prevent the development of clinical tuberculosis. It is true, certainly, what he said that we in sanatoria get a very large percentage of cases that are not clinical tuberculosis. Some of them come, too, from men of considerable experience. They feel they ought not to pass by these cases that have lost weight and perhaps have a little fever, but there are many other things that will produce the same things exactly as in-

ipient tuberculosis, and the good reports made by many of our sanatoria are not bolstered up by the finding of tubercle bacilli in the sputum.

DIABETES AND SYPHILIS: *Mason*, Amer. Jour. Med. Sci., Dec., 1921, reports two cases of non-specific positive Wassermann reactions in diabetics, in whom arsphenamine injections were followed by aggravation of symptoms, diminished sugar tolerance. Of these two cases, one was a child of five years and the other a young woman, 19 years of age. In neither was there evidence of syphilis or history of possible infection.

However, the work of Warthin and Wilson makes one reluctant to accept the ruling out of syphilis on the basis of absent clinical evidence. The work of these pathologists in demonstrating the lesions of syphilis in diabetics, even to the finding of spirochetes in the myocardium in the bodies of patients in whom syphilis had not been suspected, is calculated to make any clinician pause and consider before declaring that a positive Wassermann is non-specific.

Rosenbloom (Amer. Jour. Syph., Oct., 1921) has studied the coincidence of diabetes and syphilis, his material consisting of 139 cases of diabetes. Of these, sixteen showed positive Wassermann reactions, three of whom were without any clinical signs which would suggest syphilis.

Warthin's contention (Amer. Jour. Med. Sci., 1916, p. 157) that latent syphilis is the chief factor in the form of pancreatitis most frequently associated with diabetes, has met with vigorous opposition on the part of several writers, one of the most recent being Lemann (Amer. Jour. Med. Sci., Aug., 1921), who investigated the incidence of diabetes among negroes admitted to the Charity Hospital in New Orleans. The high incidence of syphilis among this class of patients is well known, but the incidence of diabetes is markedly lower than among the whites. In the admissions for the decade of 1910-19, the negro admissions were 43% of the total, but of the cases of diabetes, only 30% occurred in the negro. Lemann concludes that either there is no relation between the incidence of diabetes, or else there is an unexplained immunity of the negro race to syphilitic pancreatitis analogous to his immunity to locomotor ataxia. He, himself, inclines to the former opinion.

THE DIAHHRAGM IN PHYSICAL DIAGNOSIS* (Diaphragmatic Pain)

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A wide variety of pathological conditions in the chest and upper abdomen markedly alter the position and movements of the diaphragm. By careful observation, by no means a difficult matter, information of the greatest diagnostic value may be obtained, information not diagnostic of the diseases themselves but of changes in the conformation of the dome of the diaphragm which they effect. We are indebted to Dr. C. F. Hoover of Cleveland for his studies, the first of which appeared in 1913, which have aroused interest in this subject and the reader is referred to his finished article in *Oxford Medicine*.

The diaphragm actually consists of two muscles, separately innervated, which arise from the xiphoid cartilage in front, the lower six ribs laterally and the lumbar vertebrae behind. The fibres converge to their insertion in the large central tendinous area which is somewhat fixed by its attachment to the pericardium. The shape of the diaphragm (Fig. 1, A) is that of a somewhat unsymmetrical and flattened dome, the summit of which on expiration is on a level with the fifth rib on the right and the fifth interspace on the left side. The arch is much less in that portion attached to the ensiform and ribs near the median line in front. The arched position is maintained by the negative intra-thoracic pressure and the positive pressure of the abdomen. On quiet respiration the lower portions of the diaphragm, especially at the sides and behind, are in apposition with the chest wall, separated therefrom by two layers of pleura, diaphragmatic and thoracic, between which is the complementary pleural space. This space is filled in the normal only on deep inspiration by the descending lung margin. The motor nerves of the diaphragm are the phrenics, from the third, fourth and fifth cervicals. The phrenics also carry

sensory fibres supplying the central portion of the muscular sheet, an important matter in the study of diaphragmatic pain to be mentioned later. The phrenics are also the sensory nerves of the pericardium. The outer rim of the diaphragm derives its sensory nerve supply from the sixth to twelfth intercostals.

Two factors exist in the increase of volume of the thorax on inspiration; first, contraction and resultant descent of the diaphragm, and second, contraction of the scaleni and intercostal muscles which produces elevation and outward rotation of the ribs. These two muscular activities are in opposition as regards their effect on the ribs to which the diaphragm is attached. That is, the contraction of the diaphragm tends to draw the lower ribs inward while these ribs are actually drawn outward by the preponderant, antagonistic action of the intercostals. This movement of the ribs has been compared by Keith to that of a bucket handle; being attached at front and back the greatest movement is laterally. Thus in the normal there occurs on inspiration a widening of the sub-costal angle with an outward and upward movement of the rib margins.

Let us suppose that the height of the diaphragmatic dome is altered. If flattened (Fig. 1, B), the muscle is placed in a position of greater mechanical advantage and its tendency to draw in the rib margins is increased. This is due to the fact that if the fibres are less curved they are able to exert more traction at their attachments. If this flattening is great enough then the diaphragm will overcome the opposing action of the intercostals and on inspiration the lower ribs will be drawn in and the epigastric angle narrowed. On the other hand, if the dome is raised to a higher position, (Fig. 1, c), the opposite effect is produced, the dia-

phragm is more curved and its tractive costal muscles are less opposed and in effect on the ribs is lessened, the increase in the inspiratory flare of the ribs occurs. This alteration in the position of the diaphragm may be unilateral, consequently, the movements of the rib margins may be altered on one side only. Furthermore, the arch being flatter in that position arising from the ribs near the median line anteriorly, depressions or elevations in this area have greater effect on the movements of the ribs. With depressions here the rib borders close to the median line may be drawn in, while lower down they show their normal outward movement.

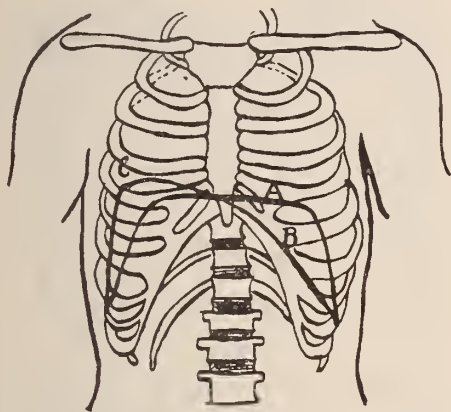


Fig. 1.

Line A—Normal position of diaphragm. Rib margins move outward.

Line B—Low position of diaphragm. Rib margin moves inward.

Line C—High position of diaphragm. Outward movement of ribs exaggerated. (After Todd.)

In studying the movements of the rib margins inspection and palpation are combined. The patient is placed in the recumbent position with chest and upper abdomen bared. The hands of the examiner are placed on the lower antero-lateral part of the thorax with fingers slightly flexed so that they rest on their tips on the lower ribs. The thumbs lie along the margins of the ribs pointing toward the ensiform. The patient is directed to breathe slowly and fairly deeply. The movements of the ribs as transmitted to the hands are both seen and felt. Practice in this

method of examination will enable the examiner to detect even slight variations from the normal outward movement.

Conditions in which the lung volume is increased will depress the entire diaphragmatic dome and alter or even reverse the normal movements of the rib margins. This is seen typically in emphysema and in the paroxysms of asthma. Given an asthmatic patient with failing heart, a condition in which conclusions from examination of the heart are most difficult to draw, examination of the rib movements will serve to determine how much his cyanosis and distress is due to circulatory failure and how much to bronchiolar spasm. Flattening is produced by pneumothorax, pleural effusion and tumors. Observation of the movements of the ribs will sometimes decide the often difficult differential diagnosis between thickened pleura and pleural effusion and between pleural effusion and massive consolidation. Signs of flattening of the sub-cardial portion of the diaphragm are of very considerable value in the diagnosis of pericardial effusion. Here alteration in the movements of the rib margins near the median line occurs, the movements at the sides being unaffected. The rib movements in pericardial effusion are also of value as a guide to tapping. If there is sufficient fluid in the pericardial sack to impede diastole, inspiratory narrowing of the sub-costal angle occurs. Great enlargement of the heart exerts a like effect depending on what part of the heart is enlarged. Dilatation of the left ventricle flattens the diaphragm to the left of the median line; the effect of right sided enlargement is more evident on the right.

Elevation of the diaphragm and increase in the effect of contraction of the intercostal muscles, *i. e.*, exaggeration of the outward movement of the rib margins, is seen sometimes in patients with old pulmonary fibrosis. In these outward movement of the ribs takes place, provided the diaphragm is not adherent to the chest wall. In the latter case the diaphragm has what amounts to a new attachment and, its

fibres now being less curved, will exert a greater pull, so instead of moving outward the ribs are drawn in. The diaphragm is also subject to elevation by pressure from below by tympanites, ascites, sub-phrenic abscess, enlargement of the liver, tumors of the stomach, spleen, etc. In sub-phrenic abscess increase in the outward movement of the ribs may be the sole physical sign which serves to locate the fluid below the diaphragm and to differentiate the condition from empyema. In paralysis of the diaphragm, usually seen after trauma to the neck, the muscle remains in high position and the action of the intercostals is unopposed. The reverse occurs with paralysis of the intercostal muscles in some diseases of the cord.

In summarizing the changes in the movements of the costal margins it may be said that if movement toward the median line occurs there exists either flattening of the corresponding portion of the diaphragm, or paresis of the intercostals or adhesion of the diaphragm to the chest wall. Conversely, if the normal outward movement is exaggerated, there is either high position of the diaphragm or paresis of that muscle.

DIAPHRAGMATIC PLAN (Fig. 2)

The sensory nerves of the diaphragm, that is, the phrenics to the central portion and the six lower intercostals to the outer margin, also supply the contiguous pleura and peritoneum. For this reason pain due to irritation of the diaphragm and of its serous coverings must be considered as one subject.



Fig. 2.

Diagram of surface of diaphragm. Area of white represents portion innervated by phrenic nerves. Black area portion innervated by lower six intercostals. (After Capps.)

The effect of irritation of the diaphragmatic pleura has been worked out by Capps in studies of the pain in pleurisy and pneumonia and by mechanical irritation through a trocar in the course of chest aspirations. The pain produced by irritation in the phrenic distribution is a typical referred pain located in the neck, usually at the border of the trapezius, (Fig. 3) and in the distribution of the third and fourth cervical nerves. This area is quite tender and is surrounded by a hyperalgesic zone. The pain in the neck as the needle enters the pericardium on paracentesis is typical of phrenic irritation.

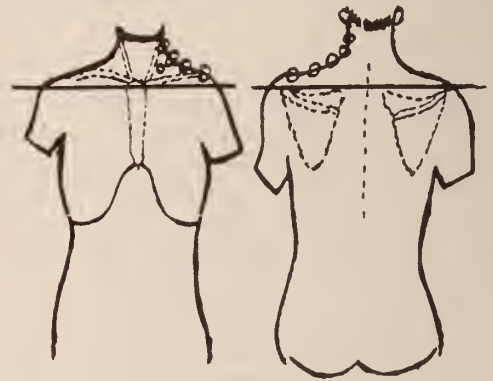


Fig. 3.

The horizontal line across the shoulders indicates the lower limit of the area innervated by the 4th cervical nerves. The circles show the common location of referred diaphragmatic pain. (After Capps.)

Irritation of the outer margin of the diaphragm produces pain over the lower thorax, epigastrium and upper abdomen. If the pain is severe, extension downward over the whole abdomen may occur. There is an overflow of the stimulus to cord segments lower than those irritated. If the seat of irritation is at the posterior margin the pain is felt in the lumbar region. This abdominal pain of diaphragmatic irritation is, like the pain in the neck, a true referred pain. The tenderness which accompanies it is in the skin and abdominal wall and while muscular rigidity is present to a certain extent these patients bear deep pressure better than those with inflammatory disease of the underlying viscera. In either neck or

abdominal pain the discomfort is augmented by strapping the chest since movement of the diaphragm is thereby increased; a tight abdominal binder may give great relief by the opposite effect.

Diaphragmatic pain referred to the abdomen has been a prolific source of diagnostic errors. Operations for appendicitis in patients who really had a beginning pneumonia have occurred in the experience of most of us. Study of the neck and abdominal pains of the tuberculous often reveals a diaphragmatic pleurisy. In sixty-one cases of diaphragmatic pleurisy studied by Capps, appendicitis was diagnosed incorrectly in nine cases, two of whom came to operation. Six cases were diagnosed cholecystitis with two operations. Gastric ulcer was diagnosed twice with one operation, liver abscess twice with one operation, and kidney stone, lumbago and brachial neuritis once each. This author suggested the following points in the differential diagnosis of pain referred from the diaphragm and that due to inflammation of the abdominal viscera.

1. The skin and muscles are more sensitive in pleural pain than in visceral disease.

2. Skin reflexes are more lively in referred pain as a rule.

3. In referred pain, deep pressure with the flat of the hand is well borne while in visceral disease it elicits a dull, deep pain.

4. In referred pleural pain, evidences of respiratory infection are usually present, namely, cough, expectoration, herpes, sore throat, high leucocytosis, rapid respiration.

5. Appearance of localized pain in the neck on the same side of the abdominal pain often reveals the true nature of the condition.

6. Referred pain in neck or abdomen is usually increased or induced by cough and deep inspiration. (To this should be added by belching.)

7. Nausea and vomiting are more constant in abdominal inflammation but may occur in diaphragmatic pleurisy.

CONCLUSIONS

Study of the movements of the diaphragm often give valuable information in diseases within the chest and upper abdomen. The normal movement of the rib margins on inspiration is upward and outward with widening of the epigastric angle. Depressions of diaphragm, localized or as a whole, place this muscle in a position of greater mechanical advantage and permit it to diminish or reverse the normal rib movement, depending on the extent and location of the depression. Elevation of the diaphragmatic arch produces the opposite effect, that is, increase in the outward movement of the ribs.

Exclusion of diaphragmatic inflammation is necessary in the diagnosis of acute surgical diseases of the abdomen. Pain in the diaphragm or its serous coats is referred to the neck when the central portion of the dome is involved, and to the lower thorax when the irritation is at the outer diaphragmatic margin.

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CONCERNING TREATMENT OF SYPHILIS*

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With the possible exception of the individual who devotes himself exclusively to the treatment of syphilis, no one is more truly qualified to treat it than the urologist. As specialists in diseases of the genito-urinary tract, you are naturally sought as specialists in this field also. Unfortunates suffering from this disease have a right to expect from you more intelligent management of their malady than they would receive at the hands of the general practitioner, the internist, or the general surgeon. In support of this contention, it is only necessary to mention one reason, and one organ, the kidney. Progress in urology has taught the other branches of medicine to recognize and be guided by the studies of kidney function. Is there one among you who will deny that the function of the kidney is synonymous with the safety of the patient under active anti-luetic treatment? Then you must accept the responsibility which your pioneering carries with it, take up actively and openly the treatment of syphilis as yours, by right of superior ability, and bend your energies to making your position not only tenable, but secure. In adding the syphilitic to your clientele, you must prepare to give him better management than he can secure elsewhere, and, in order to make this preparation complete, you must broaden your horizon to embrace some of the qualifications of every specialty of medicine. The modern trend of medical education in the specialties tends toward narrowing rather than broadening along these lines. Men are trained as specialists in every line, and what is of more importance, practice as specialists, before they have an opportunity to try their clinical ability by the acid test of general practice. What is more conducive to the formation of a rut or a near-sighted vision? Let us grasp the opportunity which the syphilitic affords

us to pull ourselves out of the rut into which too sharply limited practice may have led us.

Unlike the treatment of some other conditions which may be left to nature and a "bread pill," the rational treatment of syphilis presupposes that the disease is not a self-limited process and, in consequence, requires active treatment. The weapons with which we are armed are, in truth, two-edged. The activity of the treatment determines the fate of the patient. All of us have seen patients who have been over-treated, or who have received three doses of 606, a bottle of pills, and a "bon voyage." To divorce the syphilitic from his disease gracefully requires a deft hand which will effect the separation without doing him harm and will not leave him, minus his syphilis, worse than he was with it. He must be treated as an individual apart from his disease, and must be protected alike against the inroads of the spirochete and the harmful effects of the specifics. To the elder Keyes, we owe the truth that mercury, properly given, is not a poison, and because no syphilitic is cured without mercury, we should strive to perfect our knowledge of how properly to give it. Our training in recognizing early kidney damage is a long stride in making us superlatively qualified to pilot the good ship "specific." The kidney, however, does not always give the first warning of a shifting ballast. Loss of weight under treatment with mercury and arsphenamine, or with mercury alone, should give us pause. We may be giving too much, or not enough. If, with the loss of weight, the Wassermann is negative, and, what is infinitely more important, if the clinical symptoms are abating or have disappeared, we are probably giving too much. Then, before the kidney becomes damaged, stop the metal—to recommence it again when he is in condition to stand it. If,

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on the other hand, the disease seems to be progressing, and our patient is not standing the treatment well, as is evidenced by loss of weight or impaired kidney function, we must make every effort to discover why. So small a thing as an abscessed tooth may be the deciding factor which turns the tide against us, and against the patient, by way of his kidneys. It is not at all unusual to see an albuminuria clear up under mercury when damage to the teeth has been discovered by the x-ray and properly corrected.

Simply pulling an abscessed tooth will not correct the infection and necrosis at its root. While the teeth are being corrected, it is well to have the matter of anemia looked into by erythrocyte count and hemoglobin determination. Mercury should be withdrawn while the teeth are being treated, and this time is well spent in dealing with the anemia which is usually found to be present. Knowing these facts concerning the teeth, it is not hard to imagine that focal infection elsewhere should be looked for. Recently, a boy who had nocturia, frequency and some urgency by day, a urine loaded with pus and staphylococci, but a negative genito urinary tract, cleared up after an existing acne was properly dealt with. Another, a woman, developing temperature during convalescence from a pneumonia due to the bacillus mucosus capsulatus, was found to have a pyelocystitis from which the same organism was recovered. The kidneys of neither of these patients would have tolerated the added burden of eliminating very much mercury, yet either condition, more probably the acne or iodism, could easily have developed in the course of anti-luetic treatment.

It seems superfluous to suggest that a careful history be taken to elicit genito urinary lesions which have been forced from consciousness by the dreadful thought of syphilis. Yet there is a recent post mortem record from the Massachusetts General Hospital, in which undiagnosed lesions of both ureters were the deciding factor in salivation and death from over treatment with mercury. Insufficient treatment,

as far as correcting the syphilis was concerned, but too heavy a load for the damaged genito urinary tract to eliminate.

Mercury retained in the kidney pelvis and ureter will cause salivation. Mercurochrome was introduced into the kidney pelvis through a ureter which did not drain well, by the writer, in a non-syphilitic woman. Unmistakable salivation promptly resulted. After recovery, a smaller amount of the same salt produced the same result on two occasions which were undertaken as experiments, to strengthen the opinion that the damage done the kidney does not, of necessity, first take place in the parenchyma thereof. There was no demonstrable nephritis present; she had never been treated by mercury in any other way except a very occasional dose of calomel, none recently; and the salivation cleared up shortly after the color of the mercurochrome left the urine.

These facts would seem to indicate the wisdom of satisfying one's self that there is no back up against the kidney from any cause. Stricture or stone in the ureter is not any less frequent in syphilitics than in other individuals, and their results are apt to be more disastrous than is usual when the kidney is called upon to bear the burden of eliminating arsenic, mercury and the iodides. Gonorrhoea, with its possibilities of retention from strictured urethra or abscessed prostate, could reasonably be expected to be found often as a boon companion to lues.

Carcinoma was found in the bladder of a tabetic, whose only bladder symptom was incontinence.

Elliott and Todd (1) have shown that there is a small but positive tendency in normal individuals for the blood urea to rise and the phenolsulphonphthalein excretion to fall after the administration of mercury or arsphenamine. These laboratory findings have a clinical counterpart in the behavior of the urinary excretion after the blood urea reaches a certain level, probably first, in an increased output of high specific gravity, and later, a polyuria by night. Most careful attention to the renal function, using all the methods which we

have at our command, is often necessary to determine whether or not an existing irritation of the kidney is due to syphilis or to the exhibition of the specifics. What is sometimes thought to be a diabetes, with occasional sugar in the urine and a hyperglycæmia, has been proven, to the writer's satisfaction, to be the resulting retention phenomenon of a luetic kidney, which improved, and gradually disappeared under careful anti-syphilitic treatment.

It remains for us to determine at what point the physiological rise of the blood urea, and other retention phenomena, as well as the decreased output of phenolsulphonphthalein merges into the pathological. This is the heart of the matter. When urologists, generally, recognize their responsibility, and fix this point beyond question, the therapy of syphilis shall have made a large advance.

Since we have undertaken the treatment of syphilis, we must be alert for one very frequent pitfall. Lues attacks the lung, where it frequently complicates tuberculosis. To continue to administer arsephenamine to a patient who has pulmonary tuberculosis is frequently criminal. The size of the dose, and the interval of administration do not materially alter the result; neither does the stage of the tuberculosis nor the extent of the disease. This conclusion has been reached after having seen literally dozens of such cases die of a rapid tuberculosis following the administration of arsphenamine. When Watkins finished his first work on syphilis of the lung, it was thought that this was brought about by the rapid breaking down of syphilitic tissue, thus producing soil most favorable for the implantation of the bacillus of Koch. While this may be the process involved, we have seen a case in which there was no demonstrable, active tuberculosis, a negative Wasserman, and no history of syphilis, come to an untimely end, with hundreds of tubercle bacilli in the sputum after intravenous treatment with arsphenamine for widely disseminated Vincent's angina.

Several other arsenicals may be used intravenously in the treatment of syphilis complicated by tuberculosis,

without the danger attendant upon the use of arsphenamine. Mercury may be used to good advantage if the resistance to tuberculosis is not lowered by too large a dosage. The iodides are contra-indicated on theoretical grounds, but may be given with less danger to the patient than he will incur from the continued use of arsphenamine.

In conclusion, then, let it be suggested that the successful treatment of syphilis depends on the ability of the kidney to excrete sufficient mercury and arsenic, without damage to itself. That this kidney function may be seriously interfered with by the presence of pus at the root of a tooth or elsewhere in the body. That after elimination of mercury by the kidney parenchyma, it may be held up in the genito-urinary tract by some mechanical lesion and produce poisoning. That a careful history, and, in the presence of doubt, a cystoscopic examination, with ureter catheterization and x-ray, may be necessary to eliminate this complication. That a case of syphilis with nephritis should not be regarded as hopeless until the guarded administration of the specifics has shown that the nephritis is not leutic. That even in these cases, limitation of the protein intake will frequently enable the kidney to care for sufficient of the metals at least to arrest the syphilis. That arsphenamine, in some undetermined manner, produces a decidedly deleterious effect upon the lung of a syphilitic who has tuberculosis, and will cause his death if continued.

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PROTECTIVE MEDICAL MEASURES*

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The late World War revealed that the incidence of venereal disease among the people of the contending nations was much greater than even the best informed among us would have believed. And perhaps, the greatest benefits derived from the period of wanton destruction of human life and property was the knowledge gained which brought the nations to look upon venereal disease as a world Public Health problem.

The examination of recruits for the United States Army gave the startling

information that 5.6% of the young men coming from civil life were found to be suffering from an active venereal disease. The selection of these young men was not confined to the slums and the frequenters of dives and questionable resorts, but they came from the rank and file and were the flower of young American manhood. In order to obtain and keep armies fit to fight, it was soon demonstrated that definite plans had to be devised and executed to combat and control venereal disease infection among the troops of the American armies.

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The United States was the first nation to present a definite, well-organized campaign against the spread of venereal disease both among troops and civilians. The measures taken were unprecedented, disturbing the social conscience in many instances on account of having to correct certain long established conditions which contributed to venereal disease infection. The country was at war, however, and the pleadings of the mercenary and immoral elements were promptly answered by being told to get busy and cooperate in the work to protect the soldier boys from the sins of the communities.

Facts and figures since compiled have not only corroborated what has been general medical knowledge that venereal diseases were markedly prevalent among civilized people, but far more so than was supposed. The fact that the war was over, and that the boys had returned home to resume civil pursuits, naturally caused a cessation of war-time activities along many lines of former welfare work. The activities in relation to the control and suppression of venereal diseases, however, were continued by the United States Public Health Service, the Interdepartmental Social Hygiene Board and the different State Departments of Health, working, as a rule, under a unified plan of cooperation and coordination. That much rehabilitative and constructive good has been accomplished cannot be denied, but in order to reach the goal desired, and that is necessary to make us a nation of physically fit people, the work so well begun must by all means be continued.

We are aware that any general plan to control effectively the incidence of venereal diseases must embrace protective medical measures, together with protective social measures, informational and educational programs and scientific research. Protective medical measures concern the prevention and treatment of venereal diseases, both from a medical viewpoint and, in a correlative way, all other measures contributing to medical lines of attack. The part of the program of attack against venereal disease which is of most concern to the physician is treatment. It

is by proper treatment that infected persons are rendered non-infectious. Thus treatment is a matter of no little public concern and the physician who properly treats a case of venereal disease performs an important public service.

The principal diseases embraced in the great venereal disease plague are: Syphilis, Gonorrhea, Chancroid and Gangrenous Balanitis. The twin diseases, syphilis and gonorrhea, are the greatest offenders and are the problems we have to contend with and which we are endeavoring to conquer. A general consideration of the entire group is not intended, therefore, syphilis, the greatest offender, will be discussed to serve as a guide and to endeavor to show why the medical profession should consider the group known as venereal diseases, the greatest public health problem confronting us today. The responsibilities resting upon the medical profession in the campaign for the control of venereal disease are more exacting than applies to any other cooperating organization, in that we have the means at hand to treat them effectively and are in position to bring pressure to bear upon others to remove the contributing causes.

A disease so manifest and wide spread as to affect ten per cent of the population of the United States needs no introduction to the medical profession.

Osler styles syphilis as the greatest destroyer of the human race. From 8 to 12 per cent of all deaths are attributable directly or indirectly to syphilis, the majority of which, however, are reported as resulting from other causes, as heart disease, apoplexy, paralysis, locomotor ataxia, kidney disease, etc.

We know syphilis to be directly transmitted from parent to offspring. It causes approximately one-half of all abortions, miscarriages and still births. Eighty per cent of syphilitic parents die in early life and those who live add largely to the population of the various eleemosynary institutions.

Syphilis is contributing more largely to the reduction of race standard by the breeding of mental delinquents, moral degenerates and physically im-

paired than any other known agency. It is probably the greatest causative factor in inefficiency, insanity, pauperism and crime. Thousands of persons, while thinking themselves cured, are harboring the deadly spirochete in a latent state to be reckoned with later in life. Insurance companies have found that the death rate among people supposedly cured of syphilis to be double the rate of those who have never had it.

The above facts are brought out in order to emphasize the great responsibility resting upon the medical profession as custodians of the public health as regards these diseases, and especially those who treat them. It is imperative that every case of syphilis be effectively treated and otherwise handled according to the Public Health laws of the State, providing for the quarantine and treatment of venereal diseases. These regulations are specific, detailing certain duties and responsibilities both of local health officers and practicing physicians, also of legal authorities and the citizens of the State.

A sense of public responsibility for the venereal disease problem has taken a firm hold on people as a whole and it is up to the medical profession to fall in line in the campaign for their control or we will be severely and justly censured for our indifference.

There was recently held in Washington, D. C., the first session of the Venereal Disease Institute under the direction of the United States Public Health Service, delegates coming from both North and South America and the island possessions, aggregating more than five hundred leading men and women. The subject of venereal diseases was considered in such a broad manner that not only venereal diseases per se were considered, but a general survey of contributing causes of sex delinquency was comprehensively presented by means of lectures and discussions on biological, sociological, psychological, eugenical, pathological and hereditary factors. It is apparent that a general interest has been created in the venereal disease problems and with the facts of the ravages of these diseases known to the laity and with the successful

demonstrations made in their control ever before us, it is a safe bet that we will never drift back into the state of indifference toward this group of diseases that obsessed us before the late war. It has been aptly said that "Our ignorance and failure in handling the venereal disease problem constituted the greatest crime of American civilization."

An abstract resume of what may be accomplished by utilizing established means and measures may be presented. The prevention of venereal disease infection should be the prime object of protective medical measures, and this may be largely brought about by application of the laws of personal and preventative hygiene, prophylaxis, scientific research and correlative protective social measures. Personal hygiene and constant moral introspection and habit are the most effective preventative weapons one can use against venereal disease infection. Live well and be well applies to venereal disease infection more forcefully than to any other communicable disease.

Medical prophylaxis, aside from the application of personal hygiene, concerns medical measures in which the sex offender may be furnished means by which venereal disease infection may be forestalled or obviated through the application of prophylactics, usually in the form of germicidal solutions or ointments. This procedure, as is generally known among medical men, is not a definite barrier that will invariably protect the sinner from reaping the consequences of his misconduct, but we do know, that when the proper means are used by trained hands, (the application of prophylactics within an hour of the time of exposure) venereal disease infection, which otherwise might occur, is markedly lessened. From a moral viewpoint there is possibly no basis for venereal disease prophylactics, but from a medical standpoint there is a distinct and valuable place for prophylactic treatment.

Another very important vehicle of prevention yet to be discovered but hoped for, is conferred immunity, active or passive. It is not known at this

time that immunity can be conferred but future experimentation may find a way to bring this hoped for discovery to a realization. This must come through the channels of scientific research, either through discovering a vaccine, serum or other media. Consider what an incalculable benefit would come from such a discovery, either as a means to confer immunity or to promote a more definite and rapid cure.

The clinical treatment of venereal diseases is, at the present time, in a much better regulated condition than at any time in the history of medicine. This fact is largely due to the United States Public Health Service acting as a unifying factor in cooperating and coordinating work of treating these diseases by the different State Departments of Health, and in aiding the states to establish clinics for the treatment of venereal disease by furnishing funds and personnel in many instances, that all might be treated effectively, along modern scientific lines. The proper training of physicians who intend treating venereal diseases will go far toward solving the problem of adequate, efficient treatment. A physician should not attempt generally to treat syphilis unless he has received special training. In no other disease is the treatment so exacting, requiring more patience and judgment. A physician who gives a syphilitic patient inadequate treatment because of the fact that the essentials of treatment are not thoroughly understood, deprives the patient of any opportunity to have his disease cured or arrested, thus fostering a great and irretrievable injustice upon the victim and perhaps other innocent individuals.

One injection of arsphenamine will not cure syphilis. It takes a long, well-administered course of treatment, stretching over a period of two or more years, to be reasonably certain of a clinical cure, even in the most favorable early cases. Some cases probably are cured in a shorter time, but there is no way of establishing the fact. Cock-sure cures often result in degenerative sequelae later on. Medical practitioners should be well enough schooled in the

essentials of treatment to omit details; therefore, I shall not presume to enlighten you on this occasion.

A few words relative to handling the individual case might not be amiss. In treating syphilis, one has to keep constantly in mind that the patient is an entity, both clinically and physically, subject to idiosyncrasies and interpretations. A careful preliminary examination of the patient is necessary to determine the physical condition and discover possible contraindications for arsphenamine or mercurial treatment. A preliminary preparation of the patient is required before giving intravenous arsphenamine treatment. The preparation of the arsphenamine solution and the technique of operation is not concerned here but it is decidedly important that both be properly performed.

The fact must be constantly kept in mind that the patient's health must be carefully conserved and that such precautions as taking the blood-pressure, examining the heart, urine, etc., before each treatment be observed to guard against accidents and to insure the most favorable results.

It is needless to state that efficient laboratory facilities are absolutely essential to take care of the serological and bacteriopathological requirements. The laboratory is a most important adjunct in a program of protective medical measures dealing with venereal diseases and should be under the direction of trained, skilled workers. It is to be hoped that Arizona will not be long without a state laboratory equipped to take care of the needs of the state in this and other important matters.

In reference to public charges, it is important that the laws be observed in all matters pertaining to sex delinquency and venereal diseases, where laws or regulations are at hand for action and restraint. Inmates of state institutions should receive proper venereal disease treatment when found to be infected, to the end that the individual so infected be either cured or rendered non-infectious.

It would be of much economic value to industries to require that employees who suffer from venereal disease infec-

tion be promptly and adequately treated without financial handicap. It has been amply shown that the incapacity of the industrial workers so affected is a great economic burden on industry. Many large industrial establishments have already recognized the value of such a plan and are providing well-organized facilities for the treatment of these diseases among their employees.

We plan to interest the corporations in this state that are employing labor, in this matter, by bringing them to understand the disastrous effects of venereal disease on the health and happiness of their employees and the great economic loss sustained through impaired efficiency from the effects of this group of diseases among laborers.

Efforts will be made to induce every corporation employing a considerable number of men to designate one member of their medical staff to take care of all venereal disease cases among their employees; to encourage this physician to equip himself to treat venereal diseases scientifically and to furnish him with all necessary equipment and medicines for the treatment of venereal diseases in the most modern and scientific manner possible. If a plan of this kind can be consummated, we will have made a great advance in the control of venereal diseases within this state.

The public interest requires that every person suffering from a venereal disease, regardless of race, color or social position, be given adequate treatment, and I am not over-drawing the fact when I say, that the medical profession has it in its power to bring about this much needed result.

It is agreed that no one but a physician is qualified properly to treat venereal diseases. This is one branch of medicine that the Osteopath, Chiropractor, Christian Scientist, etc., fight shy of. This fact places an even greater responsibility upon the medical profession and it is a keener sense of this responsibility and a better preparation for the discharge of this duty that I am urging upon you.

It is a fact, I think, that physicians are disposed to take venereal diseases somewhat more serious than formerly.

There are many yet, however, that look too lightly upon the question; and, as they do not care to, or refuse to, treat them, they are hindering the program by complacently washing their hands of the whole matter. That there are unpleasant features about the treatment of venereal diseases, we all admit; but the physician's responsibilities cannot be fully discharged either to the patient or the public by giving indifferent consideration and inadequate treatment to these diseases.

The physician who treats a case of venereal disease owes it both to the patient and the public to do the job well, if he undertakes it at all.

By giving the disease adequate treatment and the patient proper consideration, we can forestall much of the drug store and quack treatment that is now so prevalent and that is working such a great detriment upon the race in arrested but uncured cases of venereal diseases.

In urging universal treatment for venereal disease patients, we are not asking that physicians work without remuneration. My experience is that most victims can pay a reasonable fee. What we are urging, however, is that all be treated scientifically and where a victim is not able to pay that he should not go without treatment, thus be permitted to become a menace both to himself and the public. There should be an organized effort among physicians and the community to see that adequate treatment is placed in reach of every victim of venereal disease regardless of his financial conditions or social standing. The State Board of Health will provide the arsphenamine free for the treatment of indigent individuals who are suffering from syphilis in a communicable form. Certainly the community or some big-hearted physician should be sufficiently philanthropic to see that treatment is properly administered. In the larger centers of population there should be established public clinics for this purpose. In smaller communities and the rural districts, some modification of the clinic arrangement may be necessary. We have endeavored in this state, where it was not

possible or practical to establish clinics, to secure the consent of some physician to treat those who are not able to pay. Some forty public spirited physicians in the state have agreed to do this work and it is urged that you inquire at the State Board of Health for the name of such physician in your community, if you do not know already, and refer such cases to him and lend him your assistance and cooperation in this much needed work in every way possible.

In order to serve best the patient and the public, every physician should either give the best possible treatment or refer his case to one who will. The question, of course, arises, to whom? It is realized that only the larger centers can support specialists. In this event a plan of partial specialization should be worked out by the physicians of the community or county by selecting one of their fellows who may be interested in this special line of work and make it possible for him to inform and equip himself for treating venereal diseases in a modern and scientific manner. Of course, he cannot expect to limit his practice to this line of work in the smaller communities, but by such partial specialization he can become an authority on the subject in his community, and patients may be referred to him by those who have not the time nor inclination to treat them, or he may be called

in consultation in difficult cases. Thus qualified, he should be selected by the Board of Supervisors or the City Council, as the case may be, to treat indigent and jail cases and be paid a reasonable fee for his services. If the medical profession would thus encourage and recognize certain physicians in the various communities, I am persuaded that it would not be long before there would be sufficient men amply equipped in the state to place the treatment of venereal diseases on a sufficiently high plane and that nostrum venders and quacks would be robbed of much of their profits and a great public service rendered.

The plan here outlined is, I believe, practical and would work a great benefit both to the medical profession and the public.

It is incumbent upon the medical profession that the Protective Social Measures Program, in dealing with venereal diseases, be made as active and effective as possible, that physicians all take a common interest in the confronting problems concerned in the treatment and eradication of the great Venereal Disease Plague. While recognizing that the public interests are paramount to those of any class or group, doctors will do well to remember that we serve ourselves best by serving others.

NEW MEXICO

The first County Society in New Mexico to send in its report for the year 1922, to the State Secretary, was Eddy County, of which Carlsbad is the principal city. The President of this Society is Dr. M. B. Culpepper of Carlsbad, and the Secretary is Dr. C. Russell, of Artesia.

ARIZONA

The first County Society to send in its report to the State Secretary, in Arizona, was Coconino County. The President of this Society is Dr. A. H. Schermann, and the Secretary, Dr. E. S. Miller, both of Flagstaff. The Society has five members.

Southwestern Medicine

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No. 2

Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

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DR. PAUL GALLAGHER, Mills Building, El Paso, Texas.....	Associate Editor
DR. WM. T. JOYNER, Roswell, New Mexico.....	Associate Editor
DR. W. WARNER WATKINS, Box 1328, Phoenix, Arizona	Managing Editor

THE MEETING OF THE TEXAS STATE MEDICAL ASSOCIATION

The Texas State Medical Association will hold its next annual meeting at El Paso, May 9-10-11. There are usually from 1,400 to 1,600 attendants at this meeting in the other parts of the state. It is anticipated there will be at least 1,000 this year. There will be a number of distinguished visitors invited to read papers.

The El Paso Medical Society is making elaborate preparations for the entertainment of the visitors and extends a most cordial invitation to the doctors in New Mexico and Arizona to be present at this meeting. It will be the only time in the history of the Texas State Medical Association when all the different sections, including the house of delegates and the general sessions have been able to meet under one roof. El Paso is the only city in the state able thus to accommodate such a large association. The El Paso county court house will have sufficient rooms and halls to do this without any of the meetings being held elsewhere.

W. L. B.

DEATHS

Dr. Chas. H. Tindall, of Yuma, Ariz., a member of the State Association, was accidentally killed recently, in an automobile accident. Dr. Tindall was a graduate of Chattanooga Medical College, class of 1905, and came to Arizona in 1919, locating in Yuma.

Dr. Chas. T. Dulin, of Tucson, Ariz., a member of the State Association and a Fellow of the American Medical Association, died January 20th, at his home in Tucson, of tuberculosis, terminating in meningitis. Dr. Dulin was an ophthalmologist, associated with the Arizona Hospital and Sanatorium. He was formerly in the United States Army, and located in Tucson about four years ago, after honorable discharge. The resolutions passed by the Pima County Medical Society are printed elsewhere in this issue of SOUTHWESTERN MEDICINE.

Dr. C. Hernandez Leon, of Tucson, a member of the State Association, and a fellow of the American Medical Association, died last fall, but report of this has only recently been received. Dr. Leon was a graduate of the University of the City of Mexico, class of 1896, coming to Arizona in 1913.

Dr. James Thomas Stone, of Corona, New Mexico, is reported to the journal as having died on November 18, 1921. Dr. Stone was born in 1881, graduated from Lincoln Memorial University, Knoxville, Tenn., coming to New Mexico in 1912.

IN MEMORIAM

In connection with the death of Dr. C. T. Dulin, of Tucson, the Pima County Medical Society adopted the following resolutions:

"Whereas, this society has been called upon to mourn the loss of our fellow member, Dr. Charles T. Dulin; and,

"Whereas, during the few years that he has been affiliated with this society—following patriotic and efficient service in the United States Army—Dr. Dulin has endeared himself to us by his kind and courteous treatment of his associates; by his deep convictions, his strict integrity, high character and sterling worth; and,

"Whereas, he has won the admiration of our profession and the entire community by his heroic struggle against the great 'White Plague'; therefore be it

"Resolved, That this society has lost a much-respected and valuable member; that this community has been deprived of the services of a skilled oculist—as well as of a loyal and useful citizen; and that a copy of these resolutions be forwarded to the family, also be spread upon the minutes of this society."

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Southwestern Division

The second annual meeting of the Southwestern Division of the American Association for the Advancement of Science was held in Tucson, Arizona, January 26th, 27th and 28th, at the University. Dr. A. E. Douglas, of the Astronomical Department of the University, is President of the Southwestern Division, while Dr. E. C. Prentiss, of El Paso, is Vice-President and Chairman of the Executive Committee.

This was a very well attended and enthusiastic meeting, a long series of papers being presented in each of the three sections,—Physical Science, Biological and Social Science. The arrangement was very good, each section having an open session with papers, as well as a separate sectional meeting for the technical papers.

Among the notable papers in the Physical Science Section were the series of astronomical papers from the Lowell Observatory at Flagstaff, and the physical, chemical and metallurgical papers from the University Faculty. The first of these papers was the reporting of the finding near Flagstaff of crystals of terpin hydrate in natural state. Terpin hydrate is a synthetic substance and, until now, has never been found in nature.

In the Biological Section, which includes the medical sciences, several papers bearing more or less directly on subjects of interest to medical men were presented.

Dr. MacDougal, of the Desert Laboratory, spoke on the factors concerned in the growth and development of cells, illustrating his points with an artificial cell devised by himself and used in his work at his laboratory.

Dr. F. E. Clements, Associate, of the Car-

negie Institute in Washington, spoke on the Changes in Climate and their effects on Life in the Southwest.

Dr. J. J. Thorner, of the Botanical Department of the Experimental Station, gave a very exhaustive report on the grasses of Arizona. This report will be of great value in future investigations on Hay Fever.

Dr. S. H. Watson, of Tucson, gave a paper on Hay Fever in the Southwest, substantially the same paper read before the meeting in Phoenix in December.

Dr. E. C. Prentiss, of El Paso, gave a paper on Gall Bladder Drainage.

Dr. W. Warner Watkins, of Phoenix, presented a paper on the Actions of Radium on Human Tissues, and A. M. Flagg, M. E., of Phoenix, wrote on the Sources of Radium.

Based on these two papers, a resolution was adopted by the Division, in general assembly, requesting the Government to take steps to conserve the available supplies of radium.

In the Social Science Section, a series of papers on Archeology were given by the faculty of the School of American Research of Santa Fe, N. M. In addition, there was an interesting paper on the Sociological Characteristics of the Southwest by Prof. Fred D. Merritt, of the Social Service Department of the University.

The three lectures were those of the President, Dr. A. E. Douglas, on The Annual Rings of Trees in Climatic Study; Dr. Henry B. Ward, of the Department of Zoology, University of Illinois, on The Struggle between Man and Wild Life in North America, an eloquent plea for conservation; and Dr. Edgar L. Hewitt of Santa Fe, on Native American Artists.

In the business meeting on Saturday forenoon,—Dr. D. T. McDougal, of the Desert Laboratory, was elected President of the Southwestern Division for the ensuing year, and Dr. A. E. Douglas was elected a member of the Executive Committee.

Santa Fe, N. M., was chosen as the next place of meeting, which will take place at the American School of Research. Some date in the Fall will be selected by the Executive Committee for this meeting.

MARICOPA COUNTY MEDICAL SOCIETY (Arizona)

At their regular bimonthly meeting, held in the Society headquarters at Third Avenue and Monroe Street, Phoenix, the Maricopa County Medical Society voted to make their annual dues for the year 1922, fifteen dollars. This is exclusive of the state dues, which are ten dollars. This fifteen dollars county dues will cover rent on their quarters, provide funds for their library, moving picture films of surgical and medical clinics, and pay all their incidental expenses.

The quarters and library of this Society would be a credit to any medical society of a city of a hundred thousand people, and the Society is to be congratulated on their enterprise.



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REX DUNCAN, M.D.
Medical Director

WE DESIRE TO CONFER and cooperate with the medical profession regarding the use of Radium in appropriate cases.

EL PASO NEWS

Dr. Wirt Bradley Dakin of Los Angeles will address the El Paso County Medical Society at the regular meeting, February 6, 1922. His subject will be: "Operability of the Senile Prostate with Motion Pictures of Prostatectomy and Presentation of Specimens."

Dr. F. P. Miller is rapidly improving from a very severe attack of erysipelas of the face.

Dr. G. Werley is again in his office, after an illness of a week's duration.

Dr. S. L. Terrell, 514 Martin building, El Paso, was admitted to membership in the Society on January 3, 1922.

The following officers will serve the Society during the year 1922: President, Dr. R. B. Homan; Vice-President, Dr. T. J. McCamant; Secretary-Treasurer, Dr. E. W. Rheinheimer; Censors, Drs. J. B. Gray, F. D. Garrett and B. W. Wright; Librarian, Dr. E. B. Rogers; Associate Editor Southwestern Medicine, Dr. Paul Gallagher; Advisory Committee, Drs. J. Vance and H. H. Stark; Milk Commission, Mrs. G. Turner and W. W. Waite; Member of Affiliations Committee of the Southwestern Division of the American Association for the Advancement of Science, Dr. E. C. Prentiss; Legislative Committee, Drs. Paul Gallagher, T. J. McCamant and E. D. Strong.

The Society will hold a joint meeting with the El Paso Realty Board and the Association of Engineers on Friday, January 13, 1922, for the purpose of taking up the mosquito question in El Paso with a view to starting agitation which will result in suitable measures being instituted by the proper authorities to permanently eradicate the mosquitoes from this vicinity, where they have been a nuisance for the past two summers.

REMOVALS

Dr. E. J. Gungle, of Casa Grande, has removed to Tucson, Ariz., where he will be engaged in practice in the future. Dr. Gungle disposed of his practice and fixtures to Dr. James E. Redden, formerly of Patagonia. Dr. Redden is established in Casa Grande.

Dr. E. W. Hayes, formerly of Tucson, associated with the Arizona Hospital and Sanatorium, is now located at Banning, Calif.

Dr. T. J. Cummings, formerly Superintendent of the State Hospital at Phoenix, is now located at Clarkdale, Ariz., where he has charge of the United Verde Hospital.

Dr. A. L. Tilton, until recently of Kingman, Ariz., has moved to Los Angeles.

Dr. P. B. Newcomb, until recently in charge of the Los Angeles branch of the Pacific Wassermann Laboratory, has now taken charge of the laboratory of the Arizona Hospital and Sanatorium in Tucson. Dr. Newcomb was formerly pathologist at the State Hospital in Phoenix.

Information has reached the journal that

Dr. C. E. Waller, of Santa Fe, a councillor of the New Mexico Medical Society, has moved from the state.

Dr. Albert Soiland, the well-known radiologist of Los Angeles, Calif., has removed his office and work rooms to commodious quarters at 1407 South Hope Street. He now has associated with him in x-ray and radium therapy, Dr. Wm. E. Costolow, formerly of the University of Pennsylvania.

ADRENALIN AND P. D. & CO.

Up to 1900 the medical profession had to be content with extracts and other preparations of the suprarenal gland that contained, besides what was wanted, a good deal of inert and possibly irritating material.

One manufacturing house at least was engaged in making a discovery—the isolation of the active principle of the suprarenal gland, or, if it is not quite accurate to speak of it as "the active principle," the pressor or blood-pressure-raising principle of the gland. For it was known that such a principle was contained somewhere in the gland substance, from the observed effect of aqueous solutions of suprarenal extracts; and it was this principle in pure form that was wanted.

Physicians need not now be told that the manufacturing house alluded to (Parke, Davis & Co.) was successful in its quest, for Adrenalin, the pressor principle sought, has been in use by the profession since 1901.

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THE ORGANIZATION AND FUNCTIONS OF THE COUNTY HEALTH DEPARTMENT*

C. E. WALLER, M. D., *Santa Fe, N. M.*
State Health Commissioner for New Mexico.

While federal, state and local health organizations are all responsible for the protection of the health of the individual citizen, the last must be the chief agency for carrying out the details of local public health work and constitute the medium through which the others may function. Thus, the extent to which health protection can be secured to any municipality or county is to be determined by the degree of adequacy and effectiveness of the local health department which it is willing to maintain.

Since the public, generally, looks to the local medical profession for advice as to the handling of health problems and expects the doctors to take the lead in any effort toward securing proper health protection for the community, the practicing physician should be sufficiently familiar with the organization and functions of a modern local health department to enable him to advise as to what may be needed in the way of organization and what the functions of such a department are.

There has been a rapidly growing tendency during the past few years toward the adoption of the county as the unit for local health work, especially in states where the urban communities are relatively small. This plan has several distinct advantages over that of maintaining separate organizations for city and county, the principal ones being

economy and uniformity of practice in administration.

The extent and character of the county organization must be determined largely, of course, by the financial resources available and the size and make-up of the population. As a rule, the most serious problem in bringing about the establishment of a health department is the securing of an adequate appropriation. On account of the fact that the taxpayer often does not realize the need for a health department, especially where no health work has been carried on before on an intensive scale, it is difficult to convince him that the expenditure of funds for a full time health department is a paying investment. While public funds should no more be wasted in the carrying out of health work than in any other governmental activity, there is ample evidence that money spent on the maintenance of a well managed health organization will yield dividends to the community, in the prevention of sickness and mortality many times greater than the amount invested. Not only can health protection be the means of preventing the people of the community, but it may result in the prevention of economic loss amounting to hundreds of thousands of dollars to the average county within untold suffering, anxiety and sorrow to the space of a year. That the expendi-

*Read before the Thirty-Ninth Annual Meeting of the New Mexico Medical Society at Albuquerque, April 29th and 30th.

ture of money for health purposes is a sound policy is well recognized by many industrial establishments which maintain well equipped health departments for the prevention of loss from physical disability among their employees.

Fifty cents per capita ought to be the minimum amount provided for the maintenance of a county health organization at the present time. Occasionally in a county where the population is relatively large for the area and the work to be done, a fairly adequate department may be maintained for less, but it is frequently necessary to go above the figure mentioned.

The minimum organization should include at least a full time health officer. There should also be a clerical assistant. For the average department the staff should include in addition one or more public health nurses and sanitary inspectors, depending upon the area and population of the county.

While the health officer should be trained and experienced as far as possible in modern sanitary practice and public health administration, his personality is the most important consideration. Few officials come in contact with the general public as extensively and intimately as the health officer. For this reason, if he is courteous and tactful and disposed to "lead" rather than to "drive," he will find the public cooperating with him because it respects him and believes in his work. If he is disagreeable, or inclined to "use the law" too frequently, he will not be able to keep it in sympathy with his activities, and he will almost surely be a failure. The health officer must also possess good judgment, ability to make sound decisions on short notice, and an infinite capacity for hard work; in a small department he must shoulder not only the responsibility, but the major share of the work as well.

The nurse should be a graduate of a recognized training school, preferably with training and experience in public health work. She should be of pleasing address and tactful, and she, too, must have capacity for hard work. The sanitary inspector need not possess special training, but should be an indi-

vidual of sufficient intelligence and good judgment to act on his own initiative in carrying out the routine of his work.

Suitable provision should be made for the transportation of the health officer and his assistants. Experience has shown that the most satisfactory arrangement is that of providing a flat monthly allowance for gasoline, oil, tires, repairs and depreciation, the individual furnishing his own car and paying for operation and upkeep.

As to the functions of the county health department, while no set group of activities can be prescribed which will fill the needs of every community, there are certain lines of work, that have been tried out, which should be included among the activities of every local organization. The health officer should study his county carefully and evaluate the importance of these activities in their relation to his particular problems.

Education of the public in health matters is unquestionably the most important function of every health department. The people cannot be expected to obey laws or regulations unless they are familiar with them, nor is it possible for the health department, no matter how active it may be, effectively to enforce laws or regulations unless the public generally will obey voluntarily. The individual should be shown that the law is for his benefit and should be convinced that his compliance is to the interest of himself and his community, so that he will want to obey. Moreover, most of the accomplishments of the health officer must be the result of activities not covered by laws, and he must therefore "sell" his work to the public through persuasion and advertising, taking particular care to let the public know what he is for and what he is doing.

The collection and study of reports of births, deaths and cases of disease constitute one of the most important activities of the health department. Through the reports of cases, the department is able to reach the source of infection with proper control measures, and keep careful watch for impending

outbreaks. Through the study of the records, the department is able to determine what its most important problems of disease control are, to devise its plans accordingly and, lastly, to measure the result of its efforts by comparison from year to year.

The control of communicable diseases is emergency work which must be carried on at all times by the health department. In carrying on this work the health officer should keep constantly in mind the fact that man himself, and not his environment, is the principal source of communicable disease. Effort should not be wasted through the placing of undue emphasis on relatively unimportant matters, such as quarantine, placarding and terminal fumigation. So far as the case is concerned, early detection and effective isolation are the most important factors. For this reason, the practicing physician and the householder should be encouraged to report promptly to the health department, and especially to take the necessary precautions in suspected cases. One of the most important activities directed toward the control of communicable diseases should be the stimulation, by the health department, of the use of biological products for immunization which have been tried out and found to be effective and safe. Should the health department furnish and administer vaccines and antitoxins? The writer believes that it should never interfere in any way with the sale or administration to persons who desire to go to their own physicians. On the other hand, however, it is a well known fact that many people who are perfectly able to pay for such service will avail themselves of it if no charge is made for administration, when they will not go to private physicians to have it done. This raises the question as to which is the most important, letting the individual go without protection, or giving it to him. Casually it would seem that the former justly should be the course. But what of the community? It is recognized nowadays that the infected *individual* is the source of most of our contagious diseases. A case of contagious disease

is therefore the most serious public health menace which can exist in a community. It is the duty of the health department to prevent disease. The immunization of persons is the one sure means of preventing infection. Is not, then, the public health paramount in this issue, and should not the prevention of cases of contagious disease be the first consideration? It may be argued that this is what isolation of infected individuals and quarantine of contacts are for. As a matter of fact, isolation of cases only partly solves the problem. Most of our contagious diseases are communicable in the greatest degree in their earliest stages, often before the health officer or even the family physician sees them. When the case has been permitted to occur, therefore, a part of the damage, in the exposure of contacts, has already been sustained by the community. The quarantine of contacts, or exposed persons, is often an expensive business, both for the individual and for the public. If there are no cases, there can be no contacts to be quarantined. Is it not better business, then, to prevent the cases in the beginning, by the surest means known—immunization of the public?

It has been claimed by some that the free administration of vaccines and antitoxins by the local health department interferes with the business of private physicians. This is at least questionable. Whenever a campaign for public immunization is carried on, there are people who become interested and go to their physicians for this service far in excess of the number who would ordinarily go to private doctors. The same line of reasoning applies in the consideration of treatment by the health department of certain cases of communicable disease, notably syphilis and gonorrhea among prostitutes, and other persons, who are able to pay for medical service but who refuse to take treatment unless required to do so. There is an educational feature in the management of free clinics and in the general administration of biological products which more than offsets any encroachment upon the field of the prac-

ting physician by the health department.

The prevention of infant mortality presents to the health department its greatest opportunity for reducing the death rate of the community, and prenatal and infant health work should always be one of the chief activities of the health organization.

The control of malaria and hookworm constitute special problems in certain sections of the country, and may present exceptional opportunities for demonstrations of the value of health departments. Extensive operations for mosquito control are expensive, however, and the health officer should always be sure that his prevalence of malaria is of such seriousness as to warrant the spending of money for this purpose.

In the control of typhoid fever and the diarrheal diseases, the securing of proper disposal of human excreta is undoubtedly the most important factor. This has repeatedly been demonstrated in the reduction of the prevalence of typhoid fever as a result of the installation of sanitary privies in rural sections and small towns. The health department should make it one of its aims to see that there is, at least, a sanitary privy upon the premises of every home in the county in which it has jurisdiction.

The sanitary control of water and milk supplies is of special importance on account of the opportunity for widespread infection from these sources. The sanitation of food supplies, fly eradication, and many other activities commonly included under "general sanitation," are also of more or less importance; but the health officer should not, as a general rule, lay too much emphasis on these matters to the exclusion of activities of relatively much greater value.

In general the undertaking of too many activities at one time by the health department should be avoided. Better results can be secured by concentrating at first on the activities which will yield the most health protection for the amount invested. It is a good plan, also, to stress certain lines of work at given times in the year. For

instance, school medical inspection, and intensive activities directed toward milk and food sanitation may be advantageously allotted to the winter months, while infant health work and the improvement of excreta disposal conditions may be stressed in the spring and summer.

In conclusion, the writer wishes to emphasize the necessity for close cooperation between the health department and the medical profession, and to express the hope that this brief insight into the organization and functions of the county health department may help to clear a common ground upon which the health officers and physicians of this state may build a mutual understanding of benefit to both.

DISCUSSION

DR. FALL: I enjoyed Dr. Waller's paper. I do not care to discuss it especially but I would like to ask one question, and that is about When a patient appears before us with certain history of syphilis, extending five or six the reporting of the venereal disease, syphilis. history. There are no definite lesions to assist you in making a diagnosis. There may be a little hoarseness. You have no Wassermann to guide you. You accept his word. He comes in for an injection of salvarsan. As old a case as that, is it reported or not?

DR. WALLER: I think unquestionably every case ought to be reported regardless of whether it is in the infective stage or not. While that case may not be of any importance from the public health standpoint as far as the spread of disease is concerned, still it enables us to arrive at some conclusion as to the prevalence of venereal diseases, and to measure our results to determine whether or not the prevalence of venereal disease is lessened as a result of our activities. I think it unquestionably should be reported. If the individual is not in the infective stage it is not necessary to give his name.

DR. DELONG: I certainly enjoyed the paper. It is unnecessary to go into the most minute details as gone into yesterday in our meeting of the Health Board. Considering the short time our Health Board has been in existence as a state organization, it has done splendid work, and I think the greatest praise should be given Dr. Waller for the interest he has taken, for the thoroughness with which he has prepared the ground work for all lines of health work and the great attendance of physicians we had yesterday for the short time of this organization. I am sure when you find a bunch of citizens who will discuss health work for four hours, an interest has certainly been created in the organization

which is bound to bear greater fruit in the years to come.

Necessarily in a brief paper like this the general outline only can be gone over, but yesterday the more minute details were gone into very thoroughly.

I am very much pleased to note the effective laboratory work which it has started and many of you doctors who have not availed yourselves of it will find it the greatest assistance to you in your work. I have found it a great help in my work in Gallup. There is never a week but from one to a dozen or more specimens are sent in to the laboratory, and, as we all know, there are a great many cases in which we need to exhaust every laboratory detail to complete the diagnosis.

I feel very much gratified that Dr. Waller has made these facilities available to every one of you physicians. In our state, with its large foreign population and more coming, and especially in our mining sections where the population is changing every day and people who are unfamiliar with our government and our health laws coming from Europe and Mexico, the main point brought out yesterday was the educational part. These people have to be educated and brought up to a standard which has taken generations in our older states to teach. We are making faster progress than those older states did. The wonderful advancement and the wonderful work done by Dr. Waller and his staff is really marvelous considering that only a few months, over a year ago, the system was established and has developed to what it is at the present time.

Every few weeks in our mining country I get requests from Europe for copies of death certificates, birth certificates, and very frequently I have to turn them down because our system has been established such a short time. No longer ago than 1910 there was no system in our country in this matter, and where large estates, frequently in America or Italy or Germany, are to be settled, it is impossible to give them records. These death and birth reports may seem small but very often large issues depend upon them in a legal way in which those things can be settled.

Various problems were discussed, which I do not choose to discuss,—the nurse problem, the midwife problem, and many other problems which would have interested you gentlemen who were not able to attend yesterday. I think the greatest credit is due to the organizer and developer of this work of which he has given you an outline in his paper.

DR. PRATT: I want to ask the State Health Officer what method he has of keeping track of those cases that are reported. I am very much interested in this work. I just returned from Chicago where I met men from all over the United States and Canada. Canada has gone into this very extensively since the war. A man from Oregon said they had been using this system seventeen years and he claimed Oregon had the smallest percentage of venereals in the late war. That speaks very well.

If we report these cases by number—as they

do, I believe, in his state,—and then if a case leaves us and goes to another physician and is not reported by that physician back to their attending physician, and not reported by name to the state health offices,—well, what method has this state to compel them to continue their treatment, if they are not taking treatment, and if they do not continue their treatment we have no protection, and certainly when we find out with the great percentage of our cases, if we can not find anything else the matter with a man we always say syphilis, and we are generally right. The number from New Mexico in the last draft was appalling; it was entirely too high.

I would like to know what method they have, if there is any at all, of compelling these people to report, and while I am on this subject I would like also to ask if the undertakers are allowed by law to bury a man and then get a death certificate a month later? The undertakers in our town will bury a man and then they will come around a month later and get a death certificate, and sometimes there is no way of tracing how that man came to his death.

DR. WALLER: In answer to Dr. Pratt's first question with regard to the keeping track of cases of venereal disease reported, I want to say that the reason the State Health Officers do not attempt something along that line is because we feared that a system would be too complicated for execution in the beginning of health work. We felt it would be better to go ahead and do a little in the beginning and then as the physicians and public became acquainted with what we were trying to do along that line, add a little more.

Our regulations at present provide that where a case discontinues treatment or where the individual conducts himself in such a manner as to expose the public, then the name of the individual must be reported to the local health officer and by him to the State Health Officer. It then becomes the duty of the health officer under the regulations to take such measures as he deems necessary for the protection of the public health, if the individual still refuses to take proper treatment or makes a menace of himself to the public health.

We have in mind an amendment to our regulations in the near future which will provide a scheme for following up these cases as they go from one physician to another. These regulations will be ready within two or three months.

About the undertakers,—unquestionably an undertaker who buries a body under any such conditions clearly violates the law. The regulations, which have the effect of law, require that before any dead body may be buried, a certificate and a burial permit must be secured from the health officer or his agent, and it is necessary before he may secure such a permit, for the death certificate to be filed, so that the death certificate must be filed before the body is buried, because without it the undertaker cannot secure the permit for the burial.

IMPORTANCE OF EARLY INTERFERENCE IN ACUTE ABDOMINAL INJURIES*

J. W. HANNETT, M. D., Gallup, N. M.

My only excuse for asking you to listen to a subject that was thrashed out and pretty well settled before my birth is some of my recent failures in acute abdominal injuries. Failures that I feel were, at least in part, due to delayed operative interference. If hours count in an acute appendix, do not seconds mean more in a ruptured viscus, or a bleeding intra abdominal vessel?

There are, generally speaking, two types of abdominal injuries that call for surgical interference, viz., perforating and non-perforating.

In the non-perforating type the history of the character of the injury is of great aid in determining the likelihood of damage done. A fruitful source of the non-perforating, in late years, is the boy who has been run over by an automobile. In these cases there may be hardly any external traumatism. Yet the intestine may have been crushed against the bodies of the vertebrae. The extent of intra abdominal injury in the non-perforating type where little or no hematoma can be discovered is indeed difficult to measure; however, if shock does not abate with the use of the usual methods of relief and muscular rigidity continues, little time should be lost before exploring. In case of injury to the solid viscera in the non-perforating type there is no excuse for delay as the amount of hæmorrhage dissipates the normal landmarks and banishes doubt.

As to the diagnosis in the perforating type of abdominal injury nothing need be said. These are the cases where rapid action gives the best results. Bull in the eighties and Murphy in the same decade dared to do what we all know today to be the only rational procedure.

In the perforating type there are three conditions to face; hemorrhage, chemical activity and bacterial infection,—all in the presence of more or less profound shock and collapse. We cannot see what is going on inside;

therefore we have no way of determining whether or not active hæmorrhage exists. It is safer to suppose that it does exist, as this will stimulate activity on our part. Shock is perhaps more often a life saver in these cases than we realize as the lowered pulse pressure keeps the blood vessels from entirely emptying themselves.

A word more about combating shock. Each may have his own pet hobby. Perhaps the best method would be blood transfusion, but few of us have a donor or donors at hand and the delay in grouping blood is apt to prove fatal. In the young adult where sodium chloride retention would be unlikely salt solution in the veins by an assistant seems most trustworthy to the writer. Blood transfusion should be used after the patient is back in bed. The fear of additional operative shock may keep the more conservative in a hesitant frame of mind. Is it not best to do what we can to anticipate more shock than remain in ignorance as to actual conditions inside the abdomen? May I not call to your attention the condition of profound shock so often seen in ruptured tubal pregnancy and is it not true that, with the escape of free blood from the peritoneal cavity, shock abates from relief of intra abdominal pressure? Shock will often disappear in the same proportion in any intra abdominal hemorrhage.

Much valuable time is often lost after patient enters the hospital. He is changed from ambulance to carrier then placed in bed; his clothes are removed by an orderly who rolls him about for five three-minute rounds; much unnecessary discussion takes place between the family and the patient, between the patient and the doctor, then between the doctor and the family, even more between consultant, surgeon and anesthesiologist. In the perforating type time is lost in any kind of examination. The

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bullet hole or stab wound is before our eyes. Palpation or percussion or any mauling of the abdomen is about as necessary or rational as chiropracting the spine or repeated vaginal examination during labor.

Upon leaving the ambulance, the patient with a perforating abdominal wound should go to the anesthetizing room; his clothes are cut off with scissors; he is placed on the operating table, dry shaved if necessary and painted by a nurse; anesthetic and salt solution are started by an assistant, the surgeon meantime preparing his hands. In ten minutes after entering the hospital the abdomen should be opened. These are all desperate cases and the time of operation should be shortened as much as possible. Much traumatism and delay may be occasioned by timid incisions. The shock of too strong retraction of the rectus through its nerve supply as well as side pull on the rectus interfering with the respiratory effort, may be eliminated by a long incision.

The long incision also enables the operator to seize quickly the bleeding points and take in at a glance the amount of damage done. No doubt perforations have been heretofore overlooked by short incisions. A point in the technique in these cases that is of some value, is protection of the wound margin by net gauze pads fastened to the cut rectus sheath by clamps. It not only improves the toilet but it provides a suitable place on which the intestine may rest, during exploration and repair. Usually only one segment of the gut is involved. Little hemorrhage is seen from the gut wall. There is usually a pouting rosette that can be quickly purse stringed. If the mesentery is not damaged, a half dozen of these perforations may be closed within a short gut segment with more safety than by resection. It is perhaps better to place a catheter in one of these holes and effect an enterostomy than resort to resection.

Hemorrhage that needs control is most often from the mesentery, the omentum or the solid viscera. A loose mattress suture of the liver will usually take care of bleeding. A large hole in

the liver is best tamponned. The writer aspirates the free blood by means of the aspirator used for the same purpose in throat operations. I have not used irrigation although it is recommended by many who give sound reasons for its use.

Infection from the large intestine, while more deadly, seems to be more prone to localize. The peritonitis from small intestine tends to become diffuse. Free drainage is always safest.

If there is no vomiting of blood before operation, gastric lavage is of value and in all perforating wounds of abdomen the patient should be catheterized before the operation in quest of blood as an aid to the necessity of investigation of the kidney, ureter and bladder while the abdomen is open.

After treatment may be divided into two stages; the immediate, when all forces at our command are utilized to overcome shock; and the secondary, when the gastro-intestinal canal is endeavoring to reestablish its function. The immediate treatment is a warm bed with the foot of same raised, blood transfusion, if at hand; if not, intravenous salt solution with one-sixtieth grain of adrenalin, six ounces of coffee and two ounces of whiskey in bowel followed soon as possible by the saline drip. Alternate the saline with glucose and sodium bicarbonate. Camphor oil seems to be of some value in these cases. When shock has been overcome and the patient is in a position to face secondary complications I feel that thorough and regular gastric lavage is a life saver in many of these cases. There is no need of hurry about catharsis. A week or ten days is soon enough. Light nourishment may be given for several days before any cathartic is indicated, if indicated at all. The amount of morphine used depends upon the individual case.

Briefly, the two most important adjuncts to a lower mortality are haste in getting the patient on the table and a liberal incision.

If we practice the same dispatch in operating that the patient's friends do in summoning us our mortality is bound to be lowered.

REPORT OF CASE

Frank Gregoria, age 14 years, Italian birth, messenger boy on September 11th, 1920, accidentally shot, .38 caliber, soft nose bullet, close range. Was shot from the front while in a stooping position, by the assailant who was lying on the floor. I mention this as it may account for the peculiar course of the bullet and the number of intestinal perforations. Bullet entered slightly to the right of the middle line, passing through the left lobe of the liver, anterior and posterior wall of the stomach in the region of the pylorus. Upon emerging from the posterior wall of the stomach it tore away an inch of the lateral and anterior walls of the fixed portion of the jejunum. There were four more perforations of the jejunum. Bullet then passed through the upper pole of the left kidney, the diaphragm and the lower lobe of the left lung, emerging between the 8th and 9th interspaces.

The injury occurred at approximately 6:40. Patient was admitted to St. Mary's Hospital at 6:45. I saw the patient at 7:00. The patient was in profound shock with a hardly perceptible radial pulse. One-eighth grain of morphine and 10 minims of adrenalin solution were given at this time.

Patient was operated at 7:40, approximately one hour after the accident. 1000 CC. of salt solution was given on the table.

Before beginning the operation the patient was catheterized and bladder was found to be full of blood.

Long incision from the xyphoid cartilage to well below the umbilicus; there was still active bleeding from the liver which was controlled by through and through mattress sutures. The

two holes in the stomach were then purse stringed and serous muscular coat suture with Pagenstecher linen. The damage done to fixed portion of the jejunum was so extensive that the jejunum had to be closed entirely; the other four holes in the jejunum purse-stringed and a posterior gastro enterostomy was of necessity performed. A drain was placed in the left kidney pouch, one also in the right kidney pouch and another between the gall bladder and the pylorus. These were all ordinary cigarette drains.

Blood and intestinal contents were aspirated by the ordinary aspirator used in throat operations.

The abdomen was closed, the patient returned to bed.

The operation required slightly more than one hour's time.

After patient was returned to bed an ounce of whiskey and 2 ounces of coffee were placed in the rectum and another 1000 CC. of salt solution and 10 minims of adrenalin given subcutaneously.

Radial pulse was imperceptible at intervals for the first 48 hours. Gastric lavage was instituted eight hours after the patient was returned to bed, and kept up every 6 hours for eight days. Urine came through the abdominal incision for ten days. Urine was bloody until the 14th day after operation. Patient made a complete recovery and was discharged from the hospital December 19, 1920, is now in school during the day. Is active in athletics and fortunately has no evidence of incisional hernia. X-ray examination this month shows a good working gastro enterostomy.

STONES IN UPPER URINARY TRACT*

KELVIN D. LYNCH, M. D., El Paso, Texas.

It is not my intention to weary you with any extensive review of the various opinions and statements made by a very large number of writers on the subject of urinary calculi. We believed that this condition was likely to be a matter of common experience to you all, and would invoke a spirited discussion of the views advanced; and, as neither time nor experience will permit me to say everything on the subject, I expect that many gaps will be filled in by those who will feel urged to say what I will have left unsaid.

It is my purpose to limit the argument to consideration of stones in the urinary tract above the bladder, excepting those which have been made to pass from the ureter into the bladder by manipulation, or have recently passed spontaneously.

You are familiar with the numerous theories advanced to account for the formation of urinary calculi: Some day we may be able to correlate the isolated facts concerning diet, water, heredity, etc., and may be able to formulate some definite plan of prophylaxis; for the present we hold to the simple working hypothesis of infection with the production of mucoid matter which forms a nucleus with bacteria, around which are precipitated various urinary salts. This infection may be severe (pyelitis, pyelonephritis, or septic infarcts), or it may be so slight as scarcely to be noticed; often there is only a slight bladder irritation, the urinary findings are meagre or absent and the case is dismissed as a "nervous bladder" or the frequency is ascribed to change in the weather.

Montiagne (Essays, Bk. 3-13) gives a classic description of a typical attack of stone, and Osler has adopted it without trying to improve on it. "Thou art seen to sweat with pain, to look pale and red, to tremble, to vomit well nigh to blood, to suffer strange contortions and convulsions, by starts to let tears drop from thine eyes; to urine thick, black,

and frightful water, or to have it suppressed by some sharp and craggy stone that cruelly pricks and tears thee." But all are not typical, and the chief symptom, pain, may vary from only a dull ache, or even only an uncomfortable feeling, to the most severe lancinating and colicky pains. In many cases there is no pain but simply an irritability of the bladder of varying degree, and my experience has borne out Brewer's statement that such is particularly the case when the calculus is in the lower third of the ureter. You are all familiar with the radiation of the typical pain; but do not forget that in a considerable number of cases it is confined entirely to the opposite side; also when the stone is bilateral pain is unilateral in more than half of the cases (64%).

Do not expect to find hematuria or even red blood cells microscopically in all instances; the urine may be absolutely negative, or it may show pus, blood, albumin, etc. Occasionally the bleeding will be so profuse that it will suggest tumor. In a recent case referred by a competent surgeon it was so excessive that the diagnosis of stone was not even considered.

Frequency of urination may be a prominent symptom. Ochsner has laid stress on the diuria and the usual absence of nocturia; W. L. Brown holds the opposite.

I believe with Ochsner that the most important element in diagnosis is a carefully written history. By it we elicit many facts which may enable us to make an accurate estimate of the total pathological condition present in each individual case, and avoid many unfortunate results in our course of treatment. Likewise it leads us to study the patient in general, a wonderfully proper and fruitful procedure when there is question of a grave operation. Moreover, we often will be given clue to an important causative factor in the disease, such as a point of focal infection; and, in the cases complicated by

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infection of the kidneys, the elimination of such foci is especially desirable for cure as well as for the prevention of recurrence of the stone. We serve our patients very badly indeed if our whole attention is focused on stone, and neglecting the associated and causative conditions, we leave him as badly off as before or perhaps a little bit worse on account of the strain to which we have subjected him by operating. A thorough physical examination is imperative and its omission not only leads frequently to failure to cure but at times results in serious harm to the patient when other conditions undiscovered by casual inspection, contraindicate the treatment employed, whether this be operative or instrumental.

As a matter of economy to the patient, when the history points to stone in the kidney or ureter as the probable diagnosis, it seems to me most advisable to combine cystoscopic and radiographic investigations from the start. I do not deny that, in some cases, especially with large stones in the kidney and of typical shape, the radiogram alone will clinch the diagnosis; but in most cases the x-ray bougie, ureterogram, or pyelogram, will be necessary to establish the actual location of shadows which, on the ordinary film, are very suspicious but not decisively intraureteral or intrarenal. On the right side this is occasionally of importance in the differential diagnosis of gall-stones. We could multiply instances in which patients came with a diagnosis of stone and a film showing a suspicious shadow; removal of the actual stone by intraureteral manipulations and relief of symptoms was followed by another film taken with an x-ray bougie in situ; the suspicious shadow was still there but far out from the line of the ureter as indicated by the bougie; the actual stone had not cast a shadow at all on the original plate. Many cases, too, without stone but with lesions, of which we will speak later, which give symptoms similar to stone, often show suspicious shadows which again the x-ray demonstrates as not being in the urinary tract when the bougie is used.

Moreover, in the larger stones re-

quiring open operation, an accurate localization is extremely desirable so that the stone may be quickly removed by pyelotomy or nephrotomy according to the evidence obtained; and the more so in cases complicated by infection and perinephritis. In many cases of kidney stone we have been able to determine exactly, in advance, what operation to perform and have thus conserved the best interests of the patient. A case in our earlier experience shows the necessity for this although at the time localization was not done; the margin of safety in this case was very small, and valuable time was lost in searching for a stone in a kidney which was imbedded in a mass of adhesions; it was finally located in a very dilated portion of the ureter two inches below the pelvis; it was the good or rather better side in a case of bilateral stone complicated by infection and very low function of both kidneys,—phthalein less than 1% per hour, right kidney; none at all from left. While the patient survived, due to an amazing vitality and rapid recovery of kidney function, there is no doubt that the operation was unduly prolonged and the additional delay might easily have resulted in a fatality.

The Bucky-Potter diaphragm has no doubt increased the percentage of positive results in films made to locate urinary calculi, and I find that I use the wax-tip catheter only occasionally to make a diagnosis following the failure of the film to demonstrate an expected stone; rather, I should say that the wax-tip test is negative also in the cases where the x-ray does not show a stone, and results in our searching very keenly for some variety of ureteral obstruction other than stone, such as aberrant vessels, movable kidney with intermittent hydronephrosis, stricture of the ureter, or tumor. In this connection it is noted that a positive diagnosis was made by the wax-tip in the case of three stones each located in a different calyx, the x-ray being negative; radiograph of the removed kidney showed the stones perfectly.

Many other differential diagnoses will occur to many of you; such as cysts with twist of pedicle, oxaluria, renal

tuberculosis, renal tumors, appendicitis, gall-stones, seminal vesiculitis, salpingitis, etc. But there are several which I would especially like to emphasize; these are spondylitis, infection of the kidney simply, and stricture of the ureter; also a few of the rarer causes of ureteral obstruction which I have encountered, viz., papilloma and diverticulum of the bladder. We can see that careful examination will solve the problem in most instances, whereas in others every diagnostic resource will have to be employed. I had intended to show a number of slides of various types of ureteral obstruction most of which were referred with an original diagnosis of stone; but time will not permit, and I merely remark here that, in our recent experience, one in every three cases sent in for stone has been a case of infection simply or of obstruction with or without infection.

A thorough consideration in detail of the treatment of various types of renal calculi, unilateral and bilateral, single and multiple, would give rise to a prolonged debate. There is no question but that a fair number of large stones in the kidney ought to be left alone unless the symptoms are severe or unless serious infection supervenes; this is especially so in regard to stones imbedded in the renal substance or practically completely filling the kidney (particularly the bilateral ones), the so-called stag-horn calculi. Greater damage is done to the kidney by the operation than is done by the stone and frequently a low grade infection is lighted up, by operation, into a serious sepsis. To completely remove such stones a complete nephrotomy is usually necessary and serious secondary hemorrhage (even 2 to 3 weeks later) is being more and more frequently reported after these operations; and if you do not go the whole distance, portions of the stone are left in, and, as a result, we have persistent renal sinuses or prompt re-formation of the stone; in fact, most urologists claim that these stones always re-form. If operation is done and the stone is unilateral, it is probably better to do a nephrectomy if the condition of the other kidney will per-

mit; and in these cases, as is no others, it is extremely important to make a thorough and accurate investigation of the whole urinary system. We have passed the stage where the mere survival of the patient after the operation is the criterion of success; as witness a case where, after nephrectomy for stone, patient died of anuria, the other kidney having a tumor. We may remove the stone but if the operation uses up more kidney tissue than the stone would in many years, we have not helped our patient at all. Above all when we do operate we must do a complete operation; *e. g.*, in one case a surgeon did a nephrotomy and removed a mass of calculous material but left a stone in lower end of ureter untouched, which simply gave the patient an infected renal sinus; later I had to remove the kidney and a stone from the other ureter as well.

In general, if the stone is in the pelvis and of a size that will not pass through the ureter, or if it is in the kidney substance and can be easily reached through a small nephrotomy incision, I believe operation should always be undertaken so as to prevent future progressive damage.

Small calculi lodged in the calices may often be dislodged by slight over-distention of the kidney and started on their passage through the ureter. In these, and in small ureteral stones, we have a choice of operative and non-operative methods. In 1915, Lewis reported twelve cases of ureteral stone he had caused to pass by intraureteral manipulation of various kinds; others had reported cases also and many urologists had been experimenting with various instruments to aid in the successful extraction of these stones without subjecting the patient to major procedures. In 1920, Braasch reported 126 cases of stones removed without operation; Bugbee 211, with many of which I assisted him; since coming to the Southwest I have removed forty-three ureteral stones by cystoscopic methods; two cases were treated unsuccessfully, another is still under treatment; five have been operated on without trial of other methods, two of these unnecessarily, I am sure, in the light of our

fuller experience; in one case an impacted stone was removed by open operation after several attacks of complete obstruction had been relieved by ureteral catheter; it was a solitary kidney, its fellow having been removed many years before, and during the attacks of obstruction would swell up to enormous size; later another stone was removed by cystoscopic methods.

The results speak for themselves; yet, I would not like to be understood as claiming that all cases should be subjected to a long trial of these procedures before operation is decided upon; many factors influence the selection of patients for this treatment.

The length of time a stone has been present is of more importance than its size provided that its diameter is not in excess of one centimeter. Braasch gives two centimeters as the limit but this is slightly smaller than our quarter-dollar, and I believe few of us will be optimistic enough to expect stones of this size to come through. My largest bulb dilator is size 20F, and that is the size of the largest stone that I have extracted; this bulb is oval and rather flattened in one dimension as stones usually are; the widest diameter is 7 mm., the shortest 4mm., the length 15 mm., and the circumference at its widest part 22 mm. There is no doubt that recent stones pass more easily after manipulation than those in place in the ureter for a considerable period of time; many of them pass spontaneously, so that ordinarily after the first attack of stone, from three to six months should be allowed before treatments are begun. In a few cases it will be necessary to try and hasten the passage by appropriate measures; one case had been in severe and continuous pain for nineteen days before he was referred for treatment; the stone was very small and sharp and was lying with its long diameter across the ureter; it was dislodged with a catheter after anesthetizing the ureter with cocaine; olive oil was injected, and the stone was passed out the next day. Old stones get encysted at times, or sacculated; this condition will usually be shown in the ureterogram and is indication for open operation. Previous op-

eration without finding the stone usually contraindicates treatment by manipulation. Many of our speediest results are obtained, however, in cases of long standing stone; dilatation of slight strictures which have retarded a stone for three or four years will result in its speedy expulsion when it is combined with the other measures indicated. Evidently any extensive and dense strictures, even dilated greatly, if that be possible, will allow only very small stones through, and, in these cases, the size of the stone is of great importance.

Again, as in the successful cases, one to eight treatments have been required; and as these are made, according to tolerance of the cystoscope, reaction, etc., at four-day to one-week intervals, much depends on the patient himself as to whether we advise open operation or manipulation treatment. There is not much difficulty about cases living in town or in the radius permitting them to come about once a week. For others it depends on how long they will be able to stay, as it may require eight weeks (the longest in the series of forty-one successful cases).

Patients who are extremely nervous or sensitive and tolerate with great difficulty the cystoscope and other instruments, those with marked enlargement of the prostate or median bar formation, female patients with well developed pelvic inflammation, should not be subjected to the intraureteral treatments unless serious kidney damage is imminent and for grave reasons open operation is contraindicated.

A few words as to the form of treatment. It is essentially an attempt to dislodge the stone and to get its long axis in line with the axis of the ureter, somewhat in the same fashion as a version does in a transverse presentation. Ordinarily, cocaine is injected to anaesthetize and thus cause a relaxation of the ureteral spasm; usually this will permit of getting the catheter past the stone, if it has been obstructed, helping to dislodge it and also allow olive oil to be placed above the stone, from which position it will be fed gradually as a lubricant around the stone in each successive position it may take as it de-

scends. Where a definite narrowing of the ureter is encountered a metal olive dilator is used; consequently, in cases which do not show a prompt advance of the stone a ureterogram should be made and the stricture searched for close to the location of the stone; some of my cases would have been successful more quickly if I had made the ureterogram at the start; several treatments were given in some of the earlier cases before I appreciated the real condition present. My two unsuccessfully treated cases were among the first I treated here in the Southwest and I believe that an unsuspected stricture was responsible for the failures.

The passage through the intramural portion of the ureter often takes considerable time, and stretching or cutting of the orifice and stretching the ureter at its point of entrance to the bladder are occasionally required. It is only rarely, in my experience, that a stone can be grasped by a forceps in the ureter unless the stone be impacted in the orifice; twice by making counterpressure with a finger in the rectum I have been able to grasp stones in the intramural portion of the ureter and extract them, and, on one occasion, grasped a stone without this counterpressure. With the added skill and experience of the last few years I am now sure that I would easily extract the stone of one of my early cases which was operated on in Boston; this stone could have been easily manipulated against the forceps by fingers inserted per vaginam and with the proper preliminary dilatation would have come out without trouble.

Ordinarily, if a stone passes to the bladder spontaneously or after manipulation, it comes through the urethra without much difficulty. I usually allow a week to elapse and then if it has not passed extract it with forceps or rongeur; if a well marked median bar is present, or enlarged prostate, or diverticulum, I remove it as soon as possible as there is considerable risk of its increasing in size rapidly and causing much trouble. I operated one case for prostatic calculus which was the result of faulty operation for kidney and blad-

der stone done some years previously by an operator, (not by a surgeon) and a nasty diverticulum of the posterior urethra, the result of the burrowing of the fragment, gave considerable trouble.

CONCLUSIONS: The mere removal of the stone from the upper urinary tract does not complete the treatment; in some cases infection, in some stricture of the ureter, in others both conditions, will require proper measures to be taken for their elimination. To allow these causative factors to remain invites recurrence and stamps our work as careless and inefficient. The focal sources of infection must also be eliminated unless we wish to risk a repetition of the same kidney and ureteral infections after we have cleared them up. I would emphasize the following statements also:

(1) Mere absence of a shadow in radiogram does not rule out calculus.

(2) Suspicious shadows must be definitely localized by x-ray bougie or pyeloureterogram before any course of treatment can logically be outlined.

(3) A fair number of large stones in the kidneys are best let alone; if operation is necessary it should be a complete operation or it will be worse than useless, as considerable damage will be done to the kidney and the stone will quickly reform. Such operations presuppose most careful and thorough examination of the whole urinary system.

(4) All kidney stones to be sub-
rately localized beforehand so that pyelotomy or nephrotomy may be decided upon in advance. The recent use of the fluoroscope at operation will aid but at times will not be utilizable, on account of difficulty of delivering kidney into the incision.

(5) Various types of ureteral obstruction must be differentiated in many cases with typical stone symptoms.

(6) The vast majority of ureteral stones do not require open operation but can be made to pass or can be extracted by various manipulations. All recent stones should be given a reasonable time in which to pass spontaneously.

THE RELATION OF THE TONSILS TO SYSTEMIC INFECTION*

T. E. PRESLEY, M. D., Roswell, N. M.

That many systemic infections arise through the entrance into the blood or lymph streams of organisms from the tonsillar crypts, either with or without primary lesions in the tonsils themselves, is now almost universally admitted. The infections may be divided roughly into two groups; first, those due to chronic conditions in the tonsils and to the absorption of organisms indigenous to the crypts; and second, those that are secondary to tonsillar lesions caused by organisms from extraneous sources; as, for example, the streptococcus infections resulting from a contaminated milk supply, *i. e.*, septic sore throat. Though the latter class of infections are often of a high degree of virulence and may result in fatal general sepsis or grave local lesions, they are to be regarded rather as accidents than as due to any inherent conditions in the tonsils themselves beyond, perhaps, a general susceptibility to infection. They may be said to be of tonsillar origin in that the infection is primary to the lymphoid nodes of the throat.

The first class of infections are due to chronic pathological conditions in the crypts or in the tonsillar parenchyma, as above stated. They, alone, can be directly attributed to the tonsils and, for that reason, they are the only ones that will be considered here. It must be remembered that the other lymphoid nodules of the pharynx may be responsible for many of these infections, but, on account of the shallowness of their crypts or because of other reasons of freedom of drainage, their importance in this respect is slight compared to the faucial tonsils. This is especially true of the lingual nodules. Among the infections that have been attributed to this source are acute or chronic arthritis, endocarditis, pericarditis, chorea, acute or chronic nephritis, neuritis, osteomyelitis, appendicitis,

pulmonary gangrene, infectious jaundice, cervical adenitis of simple inflammatory or tuberculous origin, and chronic toxemia without localized lesions other than those in the tonsils themselves. This is, by no means, a complete list of the infectious processes that have been reported as occurring secondary to tonsillar infection. In many of them the relation of the tonsils to the disease has not been above question; but we must admit that septicemia of a low grade or high grade of virulence may be of tonsillar origin, and it is evident that the infection may manifest itself by the most varied localizations, depending on the character and virulence of the organism and the conditions of resistance present at the time in the different tissues.

Nevertheless, the joint and heart lesions, with the closely associated Sydenham's chorea, subacute and chronic parenchymatous nephritis, the glandular lesions of the neck and the chronic toxemias without localized lesions are by far the most important of these infections, both on account of the frequency of their occurrence and because the clinical and pathological evidence, while perhaps not conclusive, is often of such a nature as to leave little doubt of their tonsillar origin.

The close relationship that often exists between articular rheumatism and acute tonsillitis has been observed for many years. At times the joint and throat symptoms are simultaneous in their onset, while again the tonsillitis precedes the arthritis and may even completely subside before the joint lesions develop. Subacute or chronic infectious arthritis is often associated with recurring attacks of tonsillitis, the tonsils lighting up previous to each fresh exacerbation of the joint lesions; or the tonsils may be the seat of a low grade chronic inflammation lasting for months with frequent outbreaks of a

*Read before the Thirty-Ninth Meeting of the New Mexico Medical Society at Albuquerque, April 29th and 30th, 1921.

more acute character. Endocarditis and pericarditis not infrequently follow even very mild attacks of acute tonsillitis. Chorea may be present, with or without cardiac or arthritic symptoms. Acute, subacute and chronic parenchymatous nephritis are beginning to be recognized as possible sequellae of tonsillar infections. This intimate association of the joint, heart and kidney lesions with tonsillar inflammations and the sequence of the symptoms strongly suggest that the tonsils may be the primary seat of infection. This involvement might, of course, be secondary to a primary infection elsewhere; indeed, such secondary acute inflammations of the tonsils at times occur in the course of septicemias of other focal origin. The history and sequence of events in these cases, however, are obvious, as they are, also, in the inflammatory conditions of the tonsil which follow acute nasal lesions.

The bacteriological evidence that the tonsils may be the primary focal point of these systemic infections is not absolutely conclusive; nevertheless it makes a strong connecting link between the clinical evidence and that presented by the effects of enucleation on the cardiac, arthritic or renal lesions. Poynton and Payne isolated from the crypts of a patient with acute tonsillitis, a diplococcus (*diplococcus rheumaticus*) which was identical with one they had previously found in the lesions of arthritis, endocarditis, and pericarditis. Both organisms produced similar joint and heart lesions in animals. Since this observation was made much conflicting evidence has been presented concerning the etiology of acute rheumatic fever, the character of the cocci isolated from the joints by different investigators showing considerable diversity. The recent work of Rosenow goes far towards reconciling these differences. He has isolated from the joint nodes and exudate of acute rheumatism three types of cocci which in their morphology, cultural characteristics and virulence stand midway between the *S. hemolyticus* and the *S. viridans*. By varying the cultural conditions the character of the cocci was made to change from one

form to another. They produced multiple non-suppurative arthritis, endocarditis and pericarditis in the same animal; but by changing the strain through changed cultural conditions, their affinities could be transferred to the muscles, myocardium and the kidney. Apparently these organisms are not found in the tonsillar crypts; but Rosenow and Davis have shown that transmutation of form and pathogenic properties may take place under certain conditions between the various members of the streptococcus group, and it is probable that either the *S. hemolyticus* or the *S. viridans* of the crypts may undergo transmutation to one of these intermediate forms after entering the blood current.

In cases of subacute and chronic arthritis, the deep crypts of tonsils almost invariably show pure cultures of the *S. hemolyticus*, which produce acute or chronic multiple arthritis when injected into animals. The same organism may usually be recovered from the experimental lesions. Their presence in the tonsillar crypts of patients with joint lesions, and the experimental results in animals are suggestive of a causal relationship between the tonsils and the disease, but this cannot be accepted as established as a large percentage of tonsils causing no symptoms contain the same organism; and it is well known that streptococci from any source may produce experimental arthritis in animals.

The relation of the *S. viridans* of the tonsils to lesions of the endocardium is again suggestive only. This organism is commonly found in the mouth and pharynx but is seldom present in the tonsillar crypts. It was, however, obtained by Davis in practically pure cultures in the crypts of forty per cent of tonsils from patients with endocarditis which was supposedly of tonsillar origin. It may usually be isolated from lesions of the endocardium and when injected into animals almost invariably localizes on the heart valves. It rarely causes joint lesions.

The most convincing evidence we have that tonsils are among the most important of the primary foci from

which systemic infection may take place is derived from the post-operative results of tonsillectomy. Joint, heart and kidney lesions often show such marked improvement as to leave no doubt whatever of the origin of the infection. This applies not only to those cases in which tonsillar symptoms are, or have been, present, but also to many cases in which such symptoms are absent, the tonsils being small and without demonstrable suppurative lesions or retention in the crypts. In that form of chronic toxemia or septicemia evidenced by general malaise, anemia, loss of weight, etc., but without distinctly localized lesions, the improvement is often immediate and rapid.

In the individual case the clinician is seldom in a position to say with certainty that a given systematic infection is of tonsillar origin. In those cases in which cryptic retention or suppuration is manifest or in which tonsillar inflammation is one of the features, he may proceed on the assumption that the tonsils are the source of infection. Often, however, when the tonsils are undoubtedly responsible, they show nothing on clinical examination to suggest it. The very worst conditions of retention in the deeper parts of the crypts or of chronic abscess formation in the vicinity of the capsule, may exist in a small but perfectly normal appearing tonsil. Under these conditions it is only by a process of exclusion that the tonsils may be indicted as the possible offenders; for it must be remembered that they are only one of many different sources from which systemic infections may arise. Other important sources are the teeth and gums, the gastro-urinary tract, the ears, and the nasal accessory sinuses. After other sources for the infection have been eliminated as far as possible, the removal of the tonsils may be advised as a therapeutic measure even when clinical examination fails to show any pathological condition in them. The results of tonsillectomy justify this. Often the infectious processes show marked amelioration or even subsidence after the operation.

In view of the fact that Sydenham's

chorea is often associated with rheumatism and endocarditis and also because of improvement that occurs in many patients with chorea after the removal of the tonsils and the adenoid tissue of the vault, it seems likely that the infectious agent may be introduced from this source.

That the tonsillar crypts may be the atria of infection in tuberculosis is an established pathological fact. Tuberculous lesions have been repeatedly produced by the introduction of pieces of excised tonsils into animals. The combined results of many investigators show that six per cent of all tonsils have latent primary tuberculous lesions. Basin has found only three cases of latent tonsillar tuberculosis out of 150 tonsils removed from patients without demonstrable tuberculosis elsewhere. In two cases of tuberculous glands of the neck which were excised, the tonsils showed tuberculous foci of the same character. Clinically, there were no signs by which the existence of such foci might have been determined. They are usually found accidentally after the removal of the tonsils. Tuberculous cervical adenitis frequently occurs, either secondary to the lesions in the tonsils, or, in some cases, through the passage of bacilli from the crypts into the lymphatics without the production of primary foci in the tonsils.

The possibility of tuberculous lesions in the pulmonary apices arising through this channel has been raised by Grober, who has demonstrated a direct lymphatic connection between the tonsils and the parietal pleura of the apical vault through the deep cervical and supraclavicular glands. From the results of his experiments, he argues that disease of the pulmonary apices may arise from bacilli entering through the tonsils, the final step in the process being accomplished through inflammatory adhesions between the parietal and pulmonary pleurae. While it may be admitted that pulmonary infection may take place in this way, it is probably of very rare occurrence.

The relation of age to tonsillar infection.—From the foregoing account it will be seen that the cryptic conditions in the majority of tonsils are such that

local or systemic infection may result whenever the powers of resistance of the individual are, for any reason, lowered. This is especially true of the tonsil of the child and in the fibrous hypertrophy of the adult. In the former the cryptic epithelium is so thin that it offers little mechanical resistance to the entrance of the organisms, while the debris in the cryptic is usually of considerable amount. The great cellular activity of the lymphoid tissue at this age probably has much to do with the prevention of infections; but whether the protecting agency is the outward flow of lymphocytes into the crypts, or the phagocytic power of the polynuclear leucocytes, or the endothelial cells of the reticulum, is problematic. In the tonsils of fibrous hypertrophy of the adult the crypts are particularly tortuous and show irregular constrictions and dilatations brought about by fibrous contraction. The epithelium of the crypts is, for the most part, still in the attenuated state, though an irregular thickening may be present, while whatever protection active lymphoid tissue may exert is wanting. Neither the tonsil of infancy nor the small regressive tonsil of the adult are so liable to infection, since, in both varieties, the cryptic epithelium is thick and cellular retention slight.

While these local conditions are of great importance in determining individual susceptibility to infection, it is probable that relative immunity plays the most important role here. Tonsils of patients presenting no other symptoms than those due to hypertrophy often show the worst cryptic conditions, while those that are associated with glandular or systemic infection may be small and retention in the crypts not especially pronounced. Difference in virulence of the organisms in the crypts cannot wholly explain this, as under usual conditions, their pathogenicity in animals is fairly uniform; nor can the difference in phagocytic activity of the cells of the tonsillar parenchyma be held wholly accountable. These forces undoubtedly have an influence; but the antibacterial action of the blood and lymph, which differs so widely in rela-

tion to all bacterial diseases, would seem to be the chief determining factor.

DISCUSSION

DR. ANGLE: Mr. President: This morning I heard Dr. Hendricks say: "We thought so yesterday; we don't think so today; we may think so tomorrow and we may not." This subject of local infection does not and will not explain all the infections accredited to it.

I claim to be a specialist but I cannot tell by simply looking at a tonsil whether it be certainly diseased or not and I don't think anybody can. By inquiry and observation of the past history of that child you will tell more exactly. You all remember in the old works on medicine they catalogued a disease called "Ephemeral Fever," they did not know exactly what it was due to; perhaps the stomach, worms, or what not.

We have come pretty well to the conclusion nowadays that this fever was due to local infection of the tonsil or adenoids; so, if you take up the history of these cases you can tell more about them. The general practitioner sees these cases year in and year out and knows their history. His opinion is worth a whole lot and the specialist ought always to get the history of the case from him and then he will know better what to do.

The question then arises, how are you going to find out what tonsil is diseased and which one not? What constitutes a diseased tonsil? That is a problem. In a general way we say that tonsils in children under four years of age should never be touched unless there is gross interference with breathing. And that tonsils in children over four years of age, if enlarged, should be removed; that is one rule.

Then there is another thing, the plica that surrounds the tonsil; if that is thickened and enlarged, that points to trouble and if the pillars are thickened and injected we say that is an indication of disease. The hypertrophied tonsil is not necessarily diseased but the probabilities are that it is and here is the reason why we should take the history of these cases and find out if there is any absorption going on.

As regards good results from tonsillectomy and the extraction of teeth, I think that doctors are too ready to jump at conclusions. If a patient comes along with a little pain or ache or something of that kind and the doctor does not exactly know what it is, he at once indicts the tonsils or the teeth, or both. I recall, after getting back from the Army, I was very sore and stiff, making it impossible to walk without a limp after sitting down for an hour. My notion of it was, inter-muscular fibrositis rather than rheumatism, but my doctor friends at once suggested tonsils and teeth. But I am perfectly well today, and I have my teeth; they are not good but they serve the purpose for which they were intended.

As regards tonsils and erectile tissue in the upper air passages what may be said in favor of them? We have been told what harm they

can do; now what good can we say for them? It wasn't very long ago that a well known specialist, a very talented man, happened in my office as I was ready to proceed against one of these cases with surgery. It was my intention to take out the tonsils and remove the ethmoid cells and end the trouble. He said: "Dr. Angle, I don't think you ought to do that." I said, "Why?" "Well," he said, "what we believe today, we change our minds about tomorrow. We have found out this, that if you remove too much glandular tissue from the upper air passages we make these people more liable to pneumonia."

Then another thing; the tonsils may be taken out for voice reasons; some distinguished doctors say a voice will be benefited by their removal, and equally distinguished doctors cite instances where it has been ruined; take your choice.

Once a young man working in a hardware store came to me for an attack of tonsillitis. I gave him the usual treatment, and he recovered from that. The next thing I knew he telephoned, "Doctor, I cannot walk." That fellow had a tenovitis of the tendo Achilles; immediately after this attack he came down with articular rheumatism which kept him in bed for six weeks.

And, gentlemen, where I used to live there were two children who had tonsillitis. I advised tonsillectomy; the parents demurred. Later the boy came down with articular rheumatism and also developed endocarditis and will carry a heart lesion through life.

In conclusion, I want to say that I take out tonsils. I believe certain ones surely ought to come out, but I do object to the promiscuous slaughter of the tonsil just because it is a tonsil. And when you gentlemen send a tonsil to us to be removed, after getting the whole history of the case we then may be in position to act intelligently.

DR. LOSEY: I don't know that I have anything in particular to say, except that I would like to digress a little from the direct subject of the paper, in regard to what tonsils should be removed. Dr. Angle has made the statement that it was rather unusual to take tonsils out of children under four years of age. I think that is a little high. I have done a good many tonsil operations on children of two and two and a half years.

Now, what tonsils should be taken out? It is my belief that we practically never see a healthy tonsil and particularly in the earlier years of life. I believe that all tonsils are affected whether they may produce any systemic condition or not. I am one man who believes in the removal of the tonsil when we are having any trouble with it.

DR. BROWN: I would like to join in with a good deal of Dr. Angle's argument relative to the tonsil question, and I would like to disagree with him in regard to the last case cited about the cases of rheumatism that would have been avoided by removing the tonsils. A young lady came to our office who had developed acute rheumatism. She had had her

tonsils removed six months prior to that, not because she was sick but because somebody had told her if she kept those tonsils she was liable to get rheumatism. She had a very severe attack of rheumatism involving one knee joint.

We have observed a number of cases of rheumatism in cases who have had the tonsils out, and when you remember that removing the tonsils is removing only a part of the tissue, we can understand we are not going to remove only a part of this systemic disease. In children who have had their tonsils removed they are liable to get sore throats. They have all of the glands in their neck to enlarge and get sore. It is the common observation that it takes the glands to sift out the infection and if the glands are not in the throat, the glands in the neck will catch it. I cannot help but believe that this question of focal infection through the tonsils and teeth has been carried to an extreme. We have never yet seen a case of rheumatism that could be relieved by removing the tonsils or teeth. There is hardly a week that some patient does not come into our office who has had teeth removed for almost anything, from prespiring feet to shaking palsy.

I remove no tonsils, but send them all to specialists, and I believe, in certain cases, the relationship between acute tonsillitis and rheumatism is so close you can look upon it just the same as the relationship between any type of rheumatism and endocarditis. The tonsil happens to be the focus most often affected and the one most easily reached. I cannot believe but that it is being carried to the extreme, and I cannot look upon tonsillectomy as a simple matter.

DR. WYLDER: I have recently read some very interesting reports on some cases of people in early adult life with keen symptoms of thyroid poisoning, in whom, after the removal of the tonsils, the hyperthyroid symptoms entirely disappeared. I have never seen any of these cases and I would like to ask if anyone has had any experience along that line.

DR. PRESLEY: In closing this discussion I am going to relate a little experience that I had when I first went into the Army at Camp Cody. When I went into the Army in August, 1918, they put me in the cardio vascular ward and told me to learn table work. When I went in there it was filled up with chronic cases that had accumulated since the camp had been established. I had the opportunity of going over those cases for two weeks and then I was transferred to the tonsillectomy ward. There were two or three cases there for S. C. D. because of heart conditions and chronic rheumatism. The chief said he would put them in the tonsillectomy ward and remove the tonsils and see what benefit that would have.

I hadn't been in the tonsillectomy ward but a few days when these patients came over. I removed the tonsils of fourteen, and nine of the fourteen went back to limited service. I had an opportunity to see those men for two weeks after the tonsillectomy and they were all very much improved.

TUBERCULOSIS AND INFLUENZA*

DR. CHAS. M. HENDRICKS, *El Paso, Texas.*

This has been the subject of many papers the past two years, the most notable of which was one by Dr. Fishberg,¹ read before the New York Academy of Medicine more than a year ago. His conclusions were as follows:

"Epidemic influenza has no etiological relation to tuberculosis, and is not to be considered as a reactivator of dormant tuberculous lesions. Tuberculosis patients are no more liable to suffer from influenza than persons with healthy lungs, and when phthisical patients contract influenza, the acute complicating disease is not likely to run a more acute, severe and fatal course than others. The tuberculous process in the lungs has not been observed to assume a progressive course after an attack of influenza. Vital statistics and reports from some sanatoriums show that during past and current years the mortality from tuberculosis has not increased, despite the fact that influenza has been raging during this period, nor have the number of tuberculosis patients seeking admission to institutions increased during the past twelve months. The pulmonary sequellae remaining after influenza are almost without exception non-tuberculous in character and do not require the treatment accorded to phthisical patients."

When so noted an authority arrives at such conclusions, we were content at that time to study the question more closely and let another year elapse before making a report of our observations. I will begin by saying that after studying our cases for the year of 1920, we do not agree that influenza has no etiological relation to tuberculosis, particularly if we will consider the pathology of influenza sequellae in the lungs and remember what Allen Krause² has said in his *Essays on the Nature of Resistance to Tuberculosis*, viz:

"There is a fixed tissue capsule of the tubercle as an early established mechanical barrier between the imbedded bacilli and the body. As long as the barrier remains competent and prevents the passage of the bacilli to the outside, or the body fluids to the inside, there is complete isolation and no clinical tuberculosis develops. Local congestion of the surrounding tissues, however, breaks the competency of the capsule, permitting the establishment of a circulatory give and take. The adjacent tissues then become seeded with virile bacilli and active tuberculosis may begin."

This condition of affairs we know to be true, as borne out by hundreds of post mortem examinations on these cases. This alone should be enough to convince us that, with the sequellae of influenza existing and persisting for weeks and months after the attack, the patient is already a victim of active pulmonary tuberculosis or a candidate for it.

It is true that there are many cases that are non-tuberculous as far as x-ray and bacteriological examinations are concerned, but there are also many cases that have an active tuberculosis, as has been proven in our observations, many times, where we find tubercle bacilli in the sputum six months to a year after the patient has been under close observation. It is almost certain that a patient presenting, on physical examination, a shower of rales, which are increased by cough, at the angle of the scapula and inter-scapular spaces, and which persist for 12 or more weeks following an attack of influenza, should be classified as having a beginning active pulmonary tuberculosis.

During the past year we have had many patients come to us telling us they had been told they had "Flu Lungs." These cases invariably proved to have active tuberculosis.

It has also been our observation, as has been the uniform observation of others, that influenza does not attack tuberculous patients as readily as normal healthy individuals. The reason, in our opinion, is that the known tuberculous patient is living a hygienic life, sleeping in the open and is not subjected to such exposures as the normal individual necessarily undergoes when going about his daily tasks.

During this year we have only had eight cases of active pulmonary tuberculosis who contracted influenza. Four of these had complicating bronchopneumonia, all of whom died from

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three to six months following the attack. The other four cases presented no pulmonary complications, were up and about in ten days following the attack, and are still doing well.

It is hardly to be supposed that an attack of influenza would reactivate a case of pulmonary tuberculosis, or pave the way for a new infection, unless there were an accompanying bronchopneumonia or diffuse bronchitis complicating.

In studying the etiology of our cases, we have confined ourselves to the cases admitted to our institution in this year of 1920, and deal with cases positively tuberculous. Out of a total of 194 cases, 62% had influenza, 3% had arrested cases of tuberculosis reactivated by influenza, 15% had pneumonia, and 20% gave no history of influenza or pneumonia. From this it will be noted that influenza showed an etiological relation in 62%, or rather 65%, including the reactivated cases. Only 20% of the 194 cases gave no history of influenza or pneumonia.

Out of a total of 112 War Risk cases studied during the same period of time, the percentages were slightly different. Fifty-two per cent had had influenza, 22% had had pneumonia, and 26% gave no history of pneumonia or influenza. This series of 112 cases included soldiers who saw service both at home and overseas, the largest number being men who were discharged from army camps on account of pulmonary tuberculosis a short time after being drafted. Of the 112 men studied, 34 saw service overseas with combat organizations. These men had had several rigid examinations in the army camps and at least one by a tuberculosis specialist, so it is to be presumed that no active case of pulmonary tuberculosis was among those that were sent overseas, especially in a well organized division. I wish here to compliment the work of the Tuberculosis Examining Boards in these army camps; I never saw a case of pulmonary tuberculosis while overseas that did not either follow influenza or pneumonia. Of the 34 overseas men that have been under our care and observa-

tion this year, not one of them but that went through the rigid training on this side and fought throughout the campaigns over there, with no sign of pulmonary tuberculosis developing until after they developed influenza or pneumonia. I might add that 14 of these men had been slightly gassed prior to the attacks of influenza. So insidious was the onset in these cases that a positive diagnosis of pulmonary tuberculosis was not made in most cases under eight months after the attack of influenza.

It will be seen from the study of our cases, then, that influenza has been responsible for more than half of them, and that pneumonia has been responsible for about 15%.

Many patients are coming to us for diagnosis with a history pointing to an attack of influenza in 1918. These patients have never felt well since and should have been diagnosed a year ago.

If we would all follow the suggestion made by the American Tuberculosis Association, *i. e.*, every patient that gives the history of an attack of influenza should be examined from time to time by his family physician, or better, referred to a chest specialist for observation until it is positively known the patient is not tuberculous. If this procedure were adhered to by us all, we would greatly reduce the death rate from pulmonary tuberculosis.

The outstanding points of our observations are:

1. That influenza is an etiological factor in pulmonary tuberculosis.
2. That cases develop very slowly and should be recognized long before tubercle bacilli appear in the sputum.
3. That men who served overseas, who now have pulmonary tuberculosis, either had influenza or pneumonia, or were gassed, before it developed.
4. That most cases should have been diagnosed six months or a year ago.

Our conclusions are no different from those noted after the epidemic of 1789 and 1790, by such men as Rush and Drake,³ both of whom stated that there were an unusual number of cases of phthisis following that epidemic.

1—Fishberg, Maurice, *Amer. Rev. of Tuberc.* Nov. 1 1789-90 and 1807.

2—Krause, A. K., *The Nature of Resistance to Tuberculosis*, *Amer. Rev. Tuberc.* 1917, i, 65.

3—Guy Hinsdale, *Epidemics of Influenza in 1647*, 919, p. 532.

DISCUSSION

DR. MULKY: I think Dr. Hendricks has covered the ground so thoroughly there is no need for further argument. He mentioned the article by Dr. Fishberg in which it was stated there is no relation between influenza and tuberculosis. I think it has been the observation of everyone interested in tuberculosis, that there has been a tremendous increase in tuberculosis since the great influenza epidemic. In taking histories of tuberculosis patients during the past year or two, I believe at least 50% of them date the beginning of their trouble from an attack of influenza. My experience in the army service confirms this observation; following the influenza epidemic we had a marked increase in the number of tuberculosis cases in the base hospitals.

There have been many cases of the so-called "flu" chest following influenza. These cases are characterized by persistent moisture in the lungs and frequently simulate tuberculosis very closely; many of them are diagnosed as tuberculosis without the diagnosis being proved. They do not impair the health greatly, as a rule, but the signs are very persistent. I recall one case in particular that I saw in the army; he had a wet chest following flu with an enormous amount of rales. I had him under observation for six months during which time he was on duty most of the time and felt perfectly well. He was in a hard campaign overseas and I saw him at a demobilization camp some 18 months later; his chest was still wet but he was in excellent physical condition.

As to the relation of tuberculosis to influenza,—it has been stated that tuberculous patients were not so susceptible to influenza; I think Dr. Hendricks hit the point when he said that the average tuberculous patient was living in a protected environment and not exposed to the infection like the average individual. A tuberculosis sanatorium with which I was connected established a rigid quarantine during the great influenza epidemic and escaped without a single case of influenza. When the epidemic had nearly subsided a nurse went home and brought the disease back with her; it spread through the entire hospital and many patients died with it. I believe a tuberculous patient is just as susceptible to influenza as any one if he is sufficiently exposed.

DR. PETERS: There are many men, even with Fishberg's experience, who get out on a limb occasionally and saw the limb off. He has done that thing. I think he is the only tuberculosis specialist in the whole world who has arrived at the conclusion he puts forth. Every one doing tuberculosis work who has followed up cases relative to flu is convinced thoroughly in his own mind that the flu was a marked factor in starting up chronic lesions that were well healed over and also in spreading the trouble in actively tuberculous people. Before the influenza epidemic we had certain ideas of physical findings in cases of tuberculosis. We were forced to revolutionize those ideas after the epidemic of flu.

For a long while none of us would diagnose active tuberculosis when we found fremitus increased and the number of rales increased on coughing, over the base of one or both lungs. I found a number of those cases in which I was able to demonstrate tubercle bacilli in the sputum. Now, after these epidemics, and in the years to come, we probably must look much more to these basal lesions before we say they are non-tuberculous.

I agree with what Dr. Hendricks said relative to the non-interference with the general condition of the individual with those basal lesions. If they are non-tuberculous, the individual usually is in perfect health. Your x-ray will show nothing more, possibly, than a little bronchial thickening but no definite distinct shadows on the bronchial tree, and in a tuberculosis patient you will get the pathology of tuberculosis in these bases.

I believe also that a great many of these chests are pure influenza chests. There are a number of those cases that show, on physical examination, general bronchitis, with negative radiograph, and then very distinct lesions limited to the base of a lung in which tubercle bacilli are not found.

I believe also that a great many of the patients with active tuberculosis who had what was called exacerbation of the tuberculosis, possibly had, following pneumonia, a distinct influenzal infection of a portion of the lung which hastened their death.

There is a whole lot in the physical findings and in the general run of symptoms in a case that we must watch, and we have a great deal yet to learn about the difference between influenza infections and tuberculous infection of these post-flu chests.

DR. HENDRICKS: It seems to my mind to be perfectly clear that there is no reason why influenza should not increase the liability of a normal individual to contract pulmonary tuberculosis, when you consider that in influenza, complicated with broncho-pneumonia, we find leucopenia.

In speaking of these flu chests I agree that there are many cases where you will get chest findings in which there are no tubercle bacilli in the lungs, but I am speaking of cases that have symptoms, that are ill. I think those patients, if you cannot prove them to be tuberculous this year, you will next year or the next.

I have in mind a young soldier who was in France. He was gassed one day very slightly and was in the hospital two or three weeks and returned to duty. Later I had him transferred to the Medical Department so he would not be further exposed. He developed flu, was taken to the field hospital and recovered from that, and he accompanied our division up to the third army on the Rhine. During his stay up there he gained in weight and then one night, without any warning, he had a hemorrhage. He had a hard time making anyone believe it. I examined his chest and found irregular breath sounds in the lower lobe of his left lung. I ordered him to a base hospital

and he was kept under observation for twenty-five or thirty days. He went back to his command and came home with his command. That hemorrhage occurred along about the month of February, 1918. He was discharged at Ft. Worth, Texas, and on his way home to Kansas City he had a hemorrhage on the train. He

was met at the depot by his father and he looked bad. They called the family physician and he was later sent to our institution. We never, at any time, were able to demonstrate tubercle bacilli in his sputum. We posted the case and found his lower lobe filled with tubercles.

HEADACHE FROM THE STANDPOINT OF THE OCULIST*

H. L. BREHMER, M. D., Albuquerque, N. M.

The most common complaint for relief of which patients consult the oculist is headache. Fully seventy-five per cent of the average run of eye cases present this symptom first and foremost. Vision may be failing, print blur and run together, eyeballs become injected and the eyes tire, but until they reach a maximum of intensity, many patients are prone to disregard them or at least put off their correction; but a little nagging headache, recurring day after day, soon brings them to the oculist's office. There is something about cephalgia that is insistent, that demands relief. The brain worker cannot coordinate his thoughts, the laborer cannot put his best effort into his work and the housewife neglects her duties and goes to bed with a rag around her head, all because of a dull, distressing, not to be ignored pain in the head. I am speaking of the ordinary ocular headache. There is, of course, a severe, fulminating type of headache that occurs in certain diseases of the eye that I will take up later.

What is the mechanism of ocular headaches? It is described by Weber of Philadelphia in this way: "The ciliary muscle, in its effort to secure for its possessor the best possible vision under unfavorable conditions, provokes an irregular discharge of nerve energy along the oculomotor nerve to its nucleus upon which it depends for its proper government. This irritates the neighboring fifth nerve nucleus with its termination in the forehead. With this ache there

comes a deep, dull pain proceeding from the centers themselves and from the cortex through the sympathetic to the dura mater. Soon the whole front of the head aches and a typical eye strain picture is produced."

Now let me say, before going further, that the oculist does not claim all forms of headache. In fact, there are many types which he disclaims. It frequently happens that a patient will seek relief through the correction of the eyes before consulting the family physician and is surprised when the oculist refers him to his doctor for treatment of stomach or liver. "Why," he says, "there is nothing the matter with my stomach; I can and do eat anything at all times." Exactly, he does eat too much and too often. Then, too, there is the gynecological headache or pain in the top of the head. Whenever a patient tells me she has vertex pain, I hasten to inquire into the possibility of pelvic trouble, pointing out that this type of pain is rarely, if ever, helped by glasses. I do not remember a single male patient complaining of this particular kind of pain and I have made it a point to watch for it, because years ago, while an intern, I was assistant to a gynecologist of wide reputation and while on this service I was impressed with the frequency of this symptom among his patients.

Then there are other types of headache which do not come under our jurisdiction; the anemic headache; the

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toxic headache; miner's headache from the inhalation of gases; pyrexial headache (that accompanying fever); traumatic; meningeal; nasal (this is less common than generally believed); kidney (here we are interested in collaboration with the general practitioner in making the diagnosis); the headache of neuresthenia; and a number of other types. Obviously these headaches are associated with other symptoms which make the diagnosis and which call for no attention at our hands.

What type then does the oculist believe he can relieve? Briefly stated,—and this is to the general practitioner,—whenever you have tried and failed to cure any form of migraine, send that patient to the oculist. In all probability when you meet the patient again he will be wearing glasses and will tell you he is free from headache at last. Do not be afraid to refer him—you will not lose the case and you will make a friend. Often a patient, after being refracted, will come back and report a cure and incidentally boast that his family doctor made a fine diagnosis when he sent him to have his eyes examined. It far too frequently happens, however, that the family doctor, either because he fears to lose the case or through ignorance of the real situation, tries this remedy and that remedy, always hoping to hit upon the right one and finally loses the patient, who goes to another doctor who, in turn, sends him to have his eyes looked over. The patient, being relieved, thinks highly of the diagnostic ability of the second physician and tells all his friends how much he has paid out to the first doctor for finding out nothing. This first type of doctor fortunately is on the decline. The up-to-date physician makes use of all the means in his power to find out the cause of disease and the oculist is not the least of his aids. The largest clinic in this country, and probably in the world, thrives just because of this co-ordination of departments. No informed physician believes that they do better surgery than is done by our leading surgeons in the larger cities, but they do use all the means in their power in arriving at a diagnosis, and as a re-

sult of this thoroughness they have attained fame.

How, then, will we know when to refer and when not to refer a case? Whenever a patient comes complaining of a frequent, often daily, recurrence of pain in the brow, or at the temples, or just over the eyes, or occasionally in the occiput, question him as to vision, see if his eyeballs are tender or the conjunctiva "bloodshot"; if he presents any or all of these symptoms, you will be making a correct diagnosis of eye strain more times than not if you send that case to the oculist. This, I realize, sounds like a plea for more business, but I hope you can excuse me from that pretense when I say that not more than one out of ten who consult me about their eyes are directly referred by their doctor. So that, after all, it doesn't mean a great deal to the oculist but it does mean a great deal to your patient.

As an example of the foregoing let me cite just a case or two:

Mrs. B. W., age thirty-five, had had frequent attacks of so-called sick headache since her last year in college, fifteen years ago. Had always imagined it was caused by "bilious attacks," and had been treated by several physicians for stomach and liver trouble. Finally, in desperation, she decided, upon the advice of a friend, to have her eyes examined although her vision was apparently normal and she could read or sew for hours without discomfort. On examination under mydriasis I found a low astigmatic error in her right eye and a similar one in her left at an opposite axis. Lenses were prescribed and the patient has not had even a suggestion of headache since. This was about five months ago.

Another case, a child ten years old was always complaining of pain in his head when he studied. As he never complained during vacation or on Saturday or Sunday, his parents were skeptical of the headache and believed that it was used as a mask by the child behind which to hide his indolence as far as his school work was concerned. He was in a lower class than he should have been, but the teacher believed it was due to stupidity as his hearing and vision were apparently normal and his tonsils and adenoids had been removed some years before. Finally, advised by the school nurse, the parents decided upon refraction, and upon examination under a mydriatic I found quite a marked degree of myopia with astigmatism. Before dilating his pupils his vision registered 6/7.5 plus, but after dilatation he could see only 6/20. This child was using his accommodation and forcing vision, unconsciously of course, with a resultant daily

headache. Since glassing, his school work has improved and no more complaints of headaches are heard.

A third case was equally interesting. A man, aged thirty-six, was referred to me for refraction by his physician. He stated that he felt he was coming on a wild goose chase as he had been under treatment of several of the best physicians in a large city without apparent benefit. His history was this; he lived in a suburb of the city and each day, in order to go to his work, he had to ride on the train for about thirty minutes. He had always been afflicted with "car sickness" and for that reason he usually arrived at his work with a dull headache. Automobile riding had the same effect, although to a lesser degree. He was now on a "vacation," as he put it, to see if rest and travel would put his nervous system in better condition. He was wearing glasses which had been changed within a year and with which he obtained 6/6 vision; he was quite near sighted. I refracted him and found practically the same prescription as to sphere and cylinder, but in addition I found he was exophoric eight degrees for distance. I incorporated prisms in his prescription and before leaving the city two months later he reported that he had not had any discomfort since, although he had taken a trip to Santa Fe on the train and had taken many auto rides to the mountains.

These are but a few examples of scores of like cases who have been relieved.

But in order that I may not give the impression that all ocular headaches can be relieved by glasses I will briefly outline a few that usually cause the sufferer to seek the oculist first, although the family physician often has the opportunity of observing them. The first is iritis. There is, at first, a dull headache rapidly becoming lacinating and situated apparently behind the eyeballs and in the temple. The sclera is injected, the pupil is small and vision decreased, so that it is usually easy for the man in general practice to make a correct diagnosis. Another type of headache is that which accompanies glaucoma, the so-called "hardening of the eyeball." This may not be so easy to diagnose as the disease is often insidious. The patient may have had several headaches in or around the eye without any diminution in vision or a sudden violent headache may occur accompanied by hazy vision, dilatation of the pupils and more or less clouded cornea. These cases require skilled treatment.

Kidney disorder accompanied by persistent headache is another class of cases in which the diagnosis is often made by the oculist. For example:

Miss H. T., age forty-eight, teacher in the public schools, suddenly began to have pain over the right eye each day, coming on in the morning after school had been in session a short time. As she had worn glasses for close work for about five years she immediately thought of her eyes, and, although the glasses had been changed by an optician a few months before, she decided that they were incorrect. I refracted her, using homatropine, and although I did find an incorrect axis in her lenses, the big find occurred when examining the fundus with the ophthalmoscope. She had, to the upper and outer side and about 2 mm. from the disc, a well marked retinal hemorrhage. There was no other evidence of albuminuric retinitis, merely this little break in a vessel. I sent her to her physician for blood pressure examination and urinalysis, and he reported to me that her pressure was one hundred and ninety, and there was some kidney involvement. He immediately instituted treatment and that patient is today continuing her work in the schools and in excellent condition, thanks to the warning which was flashed by that little retinal vessel. Here was a case that by the merest chance was enabled to continue a very useful and happy existence and all made possible by a little ocular headache.

If this were a meeting of the Section on Ophthalmology I should like to go into detail as to the causes and treatment of these conditions, but for fear of burdening you, I must necessarily be brief and confine myself to generalities. Therefore let me say this, whenever a patient consults you about a headache of the persistently recurring variety, usually bilateral and worse toward evening, or the frequent but not necessarily daily headache occasionally accompanied by nausea to a greater or less degree, think of the eyes first and you will make a correct diagnosis more times than not. Thru your oculist you will be able to rule out refractive errors, kidney disorders, arterio sclerotic changes, the last two of which may be manifest in the eye before being able to be detected by other diagnostic methods. The possibility of iritis and glaucoma can also be thus cleared up. Should he find none of the above conditions present you will at least have eliminated the cause of over eighty per cent of headaches and a true etiology can then be more easily arrived at.

DISCUSSION

DR. PRESLEY: The doctor has covered the subject very well with his paper and I do not know that there is anything especially to add to it. He has read an excellent paper from the oculist's standpoint. The only point that I would bring out is that there are other headaches aside from what the doctor has spoken of. As I say, from the oculist's standpoint he has covered the subject very, very thoroughly, but we have a few other headaches which very frequently are attributed to other causes than the eyes, which are due to involvement of the sinuses, the ethmoid frequently, and the sphenoid sinuses.

There is a distinction somewhat between the onset of these headaches which would lead you to look for sinus involvements. The doctor has not given you the differentiation in his paper which I should think it would be well to speak of in the discussion.

In the sinus headaches, especially from the ethmoid, there is some similarity because of the fact that they often begin in the afternoons, and these headaches that begin along about four or five o'clock can very easily be mistaken either way for ocular or ethmoidal. A further point of diagnosis is that resting

the eyes does not relieve them and your patient will go to bed probably with a headache and will have a fairly good night's rest, and when the patient wakes up in the morning the headache seems to be worse, but after being up an hour or two it disappears. You can most invariably say you have an ethmoiditis.

We have a type also of headache,—I have seen quite a few recently following the flu this winter, and that is the neuralgic, which will manifest itself interoccipital, passing backward towards the occipital region and the mastoids. I have had cases that I thought had mastoiditis because of severe pain in the region of the mastoid, but we found a pain running towards the shoulder and if you made a pressure over the mastoid you found no tenderness but behind the mastoid the pain would be localized. You look at the ear. You find a normal eardrum and you trace the nerve and you find interorbital tenderness and perhaps some supraorbital tenderness, and there is a hypersensitive area around the *spheno palatine ganglia*. An application of cocaine would relieve that temporarily about the region of the ganglia. But, as I said before, the doctor has covered the field from an oculist's standpoint very thoroughly.

DR. BREHMER: I believe I have nothing further to add to what was in my paper.

SOME NEWER IDEAS ON TREATMENT OF PELLAGRA WITH REPORT OF TWO CASES*

DR. M. K. WYLDER, *Albuquerque, N. M.*

Our experience in the treatment of pellagra in this country only runs back a few years. It is only a few years ago that we heard of our first case here in this valley, and as late as 1902, Sherwell in the transactions of the American Dermatological Association, makes the statement, that "no cases of pellagra have appeared in this country, although it is sometimes imported by emigrants coming from countries where the disease prevails."

Pellagra has long been a misunderstood disease. It was, at one time, thought to be a disease caused by the sun's rays striking the skin, as the skin lesions of pellagra are almost wholly on the parts of the body not covered by

clothing; later it was described as a purely nervous disease; and later yet the conclusion was that it was caused entirely by eating mouldy corn, believed to be very much akin or similar to ergotism.

According to Lombroso, a fatty oil is derived from decomposed corn which has been called Pellagrozein. Experiments with this oil have produced symptoms somewhat similar to pellagra. However, it is now known that there are a good many cases of pellagra which have never used corn in any form. There is no doubt, however, that unsanitary conditions and either a poor diet or an eccentric diet are the main causes of pellagra. It is practically

*Read before the Thirty-Ninth Annual Meeting of the New Mexico Medical Society at Albuquerque, April 29th and 30th, 1921.

never found among people who live on a well-balanced, well-cooked diet.

The number of cases in this valley is increasing, as it is only a few years ago that we had our first case here and now I think everyone of us sees several cases each year. The disease seems to have intervals of recession and advance and with each advance the condition becomes more serious than the previous one.

I do not know how the rest of you have succeeded in your treatment of pellagra but I know my experience has been very far from satisfactory, as in nearly all the cases I have had, I have either lost track of them or they have died and with greater promptness than the reports of the Italian authorities seem to indicate; they gave the average span of from five to twelve years. However, Lombroso states that most of them either die or become hopelessly insane.

I recently read, with a great deal of interest, a report of Dr. Edward Jenner Wood, Chairman of the North Carolina Pellagra Commission, and shortly after absorbing the new ideas set forth by him, or at least they were new to me, I had the good fortune to encounter a very severe case of pellagra. A case, in fact, of the type that, with my previous experience as a guide, would have come to an untimely end.

The ideas set forth in this report are, of course, the ideas that have been generally admitted by a large school that it is caused by a deficiency in the food. It may be either in the corn or the wheat that the food is low in vitamins, and that if this low vitamin condition can be overcome the patient will recover.

This report suggests that we use the part of the corn that is not used for the meal, usually spoken of around the mill as "corn chop" which contains the husk and the germ of the grain. This I had my patient do and was able to get splendid cooperation from the family, they going to the mill and securing just this part of the grain that had just been milled and using it for making bread which should be cooked with a very low heat and also without use of baking powder or baking soda, as it is thought

these alkalies also destroy the vitamins.

This patient, when I saw her first, had the characteristic lesions on the hands with bleeding fingers, had a most distressing nausea and an almost uncontrollable diarrhea. I had this bread prepared and also had them make a porridge from this meal and had her eat as much of it as we could get her to take. She had absolutely no appetite but we insisted on her taking it whether she wanted it or not and taking it as medicine instead of food. With no other medication except four cakes of yeast a day, in two days the nausea was cut down to one or two vomiting spells in the twenty-four hours and the bowels were only moving about half the number of times they were before and the lesions on the hands were much improved. In two weeks from the time this treatment was started, she was sitting up, was taking practically a normal diet without nausea or diarrhea and the hands were practically healed. I felt that I had, indeed, learned something and was so enthusiastic about it that I promised to report this case to the State Medical Society, as I am now doing.

However, just about the time this patient was discharged I stumbled onto another case of pellagra. The second case did not seem to me as serious as the first one and with the confidence born of short experience, I gave them a great deal of encouragement and told them I had just learned a new treatment for pellagra with which I had had splendid results, and that I expected in a few days she would be feeling a great deal better. My optimism, however, was short lived, because this remarkable treatment had no effect on the diarrhea or dysentery; the lesions on the hands did not extend, if anything they improved a little; but the mental condition became steadily worse and in a few weeks from the time I saw her first, I was called upon to sign her death certificate. So, had I generalized my first case without seeing any other, I would be reporting today a wonderful cure for a disease which is getting to be rather frequent here in this valley but after having seen the second case I still feel that a remedy which gives a

fifty per cent recovery in a condition in which the outcome has always been serious, is one well worth trying.

I shall be pleased to hear if any of you have treated pellagra along these lines and, if so, what results you have

had. The explanation of this line of treatment seems so reasonable and so logical that I am going to give it further trial as I encounter more cases and find out for myself whether or not it is of value.

1—Fishberg, Maurice, *Amer. Rev. of Tuberc.* Nov. 11789-90 and 1807.

2—Krause, A. K., *The Nature of Resistance to Tuberculosis*, *Amer. Rev. Tuberc.* 1917, i, 65.

3—Guy Hinsdale, *Epidemics of Influenza in 1647*, 919, p. 532.

DENTAL DIAGNOSIS*

HOWARD RAPER, D. D. S., Albuquerque, N. M.

(NOTE.—*Stenographic report of Dr. Raper's introductory remarks leading to his lantern-discussion.

Mr. President and Members of the Society:

I promise not to keep you long. My subject is "Dental Diagnosis." I am particularly interested in diagnosis. I would like to ask you to use your imagination and see if you can think of anything in the world that is more useless than an incorrect diagnosis. Compared to an incorrect diagnosis, the rudimentary mammary gland in the male is absolutely indispensable.

If the dentist takes out the wrong tooth, it is gone. If, on the other hand, he leaves in the wrong tooth it may have a tremendous effect on the health and it may destroy considerable jaw bone. Also, some dentist may hang a couple of hundred dollars' worth of jewelry work onto it, if you are not careful.

Quite a number of years ago, a man went to the medical profession and asked them to establish dentistry as a specialty of medicine. The men he went to told him they did not think dentistry

was of sufficient importance to be recognized as a branch of medicine. I dare say, if I had been in their place, I would have said the same thing. As a result of that, dentistry was divorced from medicine and has been taught in different colleges. Up until about five years ago, dentistry struggled along, absolutely unappreciated and misunderstood. Dentistry would still be struggling along in that same way, if it had not been for the fact that you men, you medical men, came to our rescue. Without your help, we are absolutely helpless; so that when I talk to you, I want to present some of our problems, that you may help us and, by helping us, help yourselves and your patients.

Dentistry, today, is confronted by a peculiar situation. We have learned from bitter and tragic experience that our treatment in the past (our treatment of teeth, as dentists), was wrong. It resulted in actual loss of tons upon tons of jaw bone. I am not one of those who believe that bad teeth can cause hang nails, but I do believe that the teeth have a tremendous effect upon the general health of the individual.

From the time people are born, almost, they start to die. Little parts of them

*Talk before the Thirty-Ninth Annual Meeting of the New Mexico Medical Society, at Albuquerque, N. M., April 29th and 30th, accompanying lantern slide demonstration.

disintegrate. They may have cancer, typhoid fever, small pox, they may spit up little chunks of their lungs. Any number of diseases are purely disintegrating diseases, so that when we find destruction of bony tissue at the ends of tooth roots, we should take particular notice of that, because it signifies this death process which finally puts all of us in the grave.

As I said, the treatment we gave teeth in the past, after the nerve had been taken out, resulted in this destructive process. Now then, as soon as we found that out, everybody was in favor of yanking teeth out as fast as possible. We all made this mistake, the public, the dental profession and the medical profession—the public by insisting upon it, we by doing it, and you by recommending that it be done. The result is that we have taken out a lot more teeth than we should have.

The reaction is now taking place from that, just as a reaction took place last fall, in which Mr. Harding participated. The tendency, today, is not to take out the teeth which ought to be taken out. People are beginning to say, "I won't have this tooth taken out." Now then, with patients positively refusing to have teeth taken out as they did have, plus encouragement from medical men, the tendency is for the dental profession to go back to treating teeth. If the dental profession goes back to treating teeth, how should we treat them? It is no disgrace to make a mistake, but to make the same mistake over and over again is a disgrace. The difference in the treatment of the future, that the profession must give teeth, is that it must be done in stricter accord with the laws of surgical cleanliness. But we, the dental profession, will never be able to do any better without the support and realization on the part of physicians, that we must practice *aseptic surgery*, when we "treat teeth."

(Lantern Slide Demonstration.)

DISCUSSION

DR. PRATT: I am interested in this because I used to practice dentistry. When I quit den-

tistry and took up this line of work I would talk to the medical profession and they poo-hooed the idea that dentistry had anything to do with medicine in general, until I got to the point where I never said anything more about it.

Then the profession woke up and became hysterical and commenced to pull teeth out for all sorts of imaginary ills. I hope we do not go back, as the doctor said, and forget that teeth are a vital function and the ways of teeth are vital to the rest of the body. We do need the teeth. There is no artificial tooth that will ever give the same service, and if it is possible to treat them, they should be treated, often at a great expense, because artificial teeth are a great and continued expense, and I hope the dentists will save all the teeth they can, even gold crowns. I have been carrying one for twenty years and it is still good, and the root underneath it is good.

DR. WADE: I think we forget many times that teeth are to blame for a good many of the ills which people are suffering with. In the case of pernicious anemia, you will find sometimes they have had a mouthful of bad teeth for a good many years. Many troubles which avoid classification you will find, oftentimes, are caused by bad teeth. About pernicious anemia,—we have no cure for it, and if we can prevent that by taking care of the teeth we are doing a great service to many people. In the same way we can avoid rheumatism and other chronic diseases which are so difficult to do anything with.

DR. KINSINGER: This is a very vital subject to me. Like many other things people become hysterical about, I think the procedure of extracting teeth has been entirely too radical and resorted to too frequently and without reasonable cause, and I believe, as has been said, that the time has come when there will be a reaction, to my gratification. I am sure I have had many patients who have had teeth extracted unnecessarily, and I am very glad the reaction is taking place, and also that the time has arrived when the medical man and the dentist will work in better cooperation, and that the time will come when the public will be taught how to conserve that very vital part of their body, the teeth.

I am sorry the Doctor did not go into the discussion of some of the diseases but of course he hadn't the time. The principal object was to open our eyes to the most important things that we have to consider today,—that the dentists and the physicians should form a corporation, but the disease that baffles us today is the pyorrhea, and I hope that sometime in the future some doctor or some dentist will give us some light as to the conservation of teeth from this disease.

I was very much interested and gratified in hearing this discussion here today. I think it is one of the very best things that could have occurred in this state meeting. It is, I believe, the first time I have heard a discussion

of this character in our state meetings for many years, and I hope that we will have more of them.

DR. RAPER: Let me make my meaning as clear as I can. First, about pyorrhea, I cannot offer you much hope about that, and that future is not particularly bright. One man has been able to produce pyorrhea in guinea pigs by diet but he draws no conclusion from it. We do not know anything approaching enough about it, and if we don't know enough about etiology, the matter of prophylaxis is a difficult one indeed.

I talked about the dental disease which starts with decay and ends with disturbance over the entire body, because we can

easily stop that. We must not let it get to the point where we have to treat the pulp—that is nerve—canals of teeth. If the dental profession would teach the people the slogan "Never let your teeth ache," make them realize there is no sense in having the toothache, we would eliminate a lot of trouble. Out of every one hundred cases that we treat, ninety-nine need not have been, because we can fill the cavities when they are small and refill them and the disease never gets into the pulp.

I have appreciated this discussion very much. As I pointed out, I realize how much we need the assistance of the medical profession, and we cannot get anywhere without it.

REPORT OF A CASE OF MADURA FOOT*

H. S. McGee, M. D., Douglas, Arizona.

"Madura foot, fungus disease of India, or, more properly, Mycetoma, is a localized infection due to several varieties of vegetable parasites, nearly always, though not invariably, attacking the foot. It is characterized by the development of a slowly growing inflammatory tumor, and the production of granules of different kinds, which consist of mycelial growths and cell detritus from the tissues of the patient, and which are given off through fistulous openings. The disease is endemic in India, where it is widely distributed, although many places remain exempt. In recent years the disease has awakened more general interest, as it has been found in Africa, Europe and in both North and South America."¹

There are at least two clinical varieties of mycetoma, some writers describing three, the classification depending upon the color of the small granules contained in the oily, purulent discharge

from the sinuses. The most common variety is the white or yellow, next the black and the rarest is the red or pink. According to Osler and McCrae, in *Modern Medicine*, "the granules are composed of aggregations of vegetable parasites and their products. On account of their relations to the lesions the granules are presumed to be the cause of the disease and not merely secondary invaders. The white variety, or ochroid granules in some cases, are apparently identical with the granules of actinomyces. Our knowledge of the cultural peculiarities of the parasites is very meager. Musgrave and Clegg cultivated a streptothrix from a single case and produced the disease in a monkey by inoculation. The black or melanoid granules, as shown by the studies of Bristowe, Carter, Wright and others, are of an entirely different character. They consist of a mass of hyaline refringent, brown-colored, brittle substance, forming a matrix in which are imbedded a tangle of fungus

1—Keens Surgery.

*Read at the Thirtieth Annual Session of the Arizona State Medical Association at Tucson, April 15-16, 1921.

tubules or hyphae with doubly contoured walls and transverse septa." As for the red or pink variety, Jackson, in *Tropical Medicine*, growing the ochroid variety with pyogenic organisms found after a period of time, that a red or pink color developed and as Sutton² concludes, this may explain the origin of the much-discussed red growths of the streptothrix isolated and studied by Vincent and others.

Quoting Sutton,² "Although mycetoma or Madura foot, was described by Kaempfer in 1712, its occurrence, or rather its recognition, in America is of quite recent date." He then records the five cases he found in the literature and adds two more coming under his own observation, making in all up to that time, (1913) seven cases.

Winslow in the *Annals of Surgery* for 1917, has taken up the subject under the title, *Madura Foot in America* and says, "up to October, 1917, seven cases of Madura foot had been reported in the United States and Canada. Six were of the ochroid form and one of the melanoid form."

A review of the available literature from 1917 to the present time has been barren of results in finding other cases reported, so, as far as I have been able to determine, this will be the eighth case reported in the United States and Canada. I have no doubt there have been cases not reported for in a conversation with Dr. Wooley of Nacozari, Sonora, Mexico, he told me he had amputated the feet in several cases. His patients, all Mexicans, came to him because the diseased foot in each case had become so large and cumbersome that it was very difficult for them to get around. Pain was not a predominating symptom and they all had numerous discharging sinuses, the pus containing small, yellowish granules. I have no doubt these were all cases of Madura foot, in spite of the fact that neither the pus from the sinuses or any of the tissue was sent to a pathologist for diagnosis, for the clinical picture with a history of long standing, gradually in-

creasing swelling of the foot with suppurating sinuses, the pus from which contained the small yellowish granules, forms a very characteristic combination.

I report the following case:

F. R., a Mexican employee of the Copper Queen Smelter, was brought to the dispensary on October 30, 1917, after having had his left foot pinched between the bumpers of two small charge cars.

History: Age 40. Married. Born in Mexico. Been living in this vicinity of the United States for the last 20 years and has never been back in Mexico. Family and personal history negative.

Examination: Nothing of note except injury to left foot, which was swollen and tender on manipulation. No abrasions or nodules were noted. The patient complained of pain in the second toe and on the dorsum of the foot at bases of toes. X-ray was negative as to fracture. The injury was diagnosed contusion and treatment consisted of heat and massage. Three days after the accident the patient had an attack of follicular tonsillitis which responded promptly to swabbing with 25% solution of argyrol. Patient returned to work on November 9th, ten days after the injury.

In October, 1918, one year after the foot injury, patient said he noticed a small swelling on the ball of the left foot which was painless and did not interfere with walking. Paid no attention to it and does not remember whether it disappeared at any time. On April, 1919, he noticed some swelling on the dorsum of the foot with some itching but no pain.

In July, 1919, he reported at the dispensary for the first time after his discharge for the foot injury, complaining of swelling and pain on the dorsum of the left foot. This swelling was in the region of the injury sustained in October, 1917. Another member of the staff saw the patient and gave him some heat treatments for a few days, after which he returned to work, the pain having been relieved.

He came back again on December 8, 1919, on account of swelling and tenderness on top and bottom of foot. At this time there was considerable swelling on both plantar and dorsal surfaces and an incision was made in the bottom of the foot, from which could be expressed a small amount of granular pus. Later, the top of the foot was incised and pus of the same character was found. For several weeks these openings continued to drain a small amount of pus and showed no tendency to close up. A vaccine was made from the pus, which the laboratory reported as being a staphylococcus infection, and was given to the patient in increasing doses with no effect. X-rays were negative as to any bone lesion. For the next six months there was more or less discharge from various sinuses and part of the time he was able to work.

2—Sutton: *Jour. A. M. A.*, May 3, 1913.

On May 29, 1920, the patient was brought to the dispensary with a third degree burn about the size of a quarter, which was centered on the crest of the swelling on top of the left foot. After dressing with vaseline he returned to work and continued until June 11th, at which time the pain to the burn was severe enough to compel him to use crutches. At this time the swelling on top the foot seemed to be a distinct nodular tumor about 2 by 3 inches. On June 29th I sent him to the hospital and removed the growth, which rested on top the tendon sheaths and was easily removed except at the bases of the second and third toes, in which location the line of cleavage was lost and it became necessary to use a sharp curette. After thoroughly curetting all suspicious looking areas the wound was closed. The skin flaps sloughed and it became necessary to do a skin graft. Patient was discharged from the hospital August 9th, with wound practically closed. A piece of the growth was sent to Dr. Hartman, of the University of Texas, and he returned a diagnosis of mycetoma.

Within two weeks after patient left the hospital the wound was entirely healed but in a short time it became necessary to open up some small abscesses which would drain for a few days or weeks. One by one these would close up, only to have others open. The pus from all these sinuses would at times contain the characteristic yellowish granules.

After the operation the bottom of the foot was unchanged, there being some nodular swelling and at times, one or more discharging sinuses. There has been no return as yet of the growth on the dorsum, except for a few small nodules at the bases of the second and third toes.

Besides the operation, treatment has consisted of cyanide of mercury dressings, 1 to 3,000, x-rays, incision and drainage of fluctuating areas as they appeared, injection of Tr. Iodine into the sinuses and into one detached nodule on the bottom of the foot 1% solution of mercurochrome was injected every other day for three weeks without any apparent change in the condition. He was given Pot. Iod. in increasing doses over a long period of time. The patient was advised to have the foot amputated and has not been seen since.

NOTE.—After completing this paper the patient came to the dispensary April 12, 1921, and reports that there has been no discharge from the foot for three months. The circumference of the foot is 1½ inches greater than the other and there are several pea-sized nodules on the bottom of the foot. He walks with no discomfort, has no pain and is very anxious to get back to work.

COLIC IN THE BREAST-FED INFANT*

DR. H. A. STROUP, Artesia, N. M.

I have two cases of this nature to report to you, both boy babies. The mothers are multipara and well nourished; births were normal and babies are growing and, to all intents, healthy except they cry most of the time, especially at night.

There is just one point in the mothers' histories and that is they both were bothered with the sour stomach of pregnancy throughout the entire nine months and for a few days after delivery, and both were great users of magnesia. I sometimes think that this had some connection with the colic of the children.

The attacks of crying, which occurred at frequent intervals, were accompanied

by frantic movements of the extremities, and a hard, tense abdomen. At times much flatus was expelled. The stools looked rather normal, usually twice, sometimes three or four times a day, with occasional curds. The child was allowed to nurse regularly two hours apart and, during feeding, would not cry at all, but usually after each feeding. The colic lasted, in both cases, about six weeks.

I know of no condition, comparatively normal in nature, which can cause so much disturbance in a home as colic in the baby. Many a child I know is stamped with colic; the cause is improper handling and care, combined with its own neurotic tendencies.

*Read before the Eddy County Medical Society at Artesia, N. M., April 25, 1921.

You all know how some mothers make a mountain out of a mole-hill. It is comparatively easy to tell whether a baby is spoiled or whether it has colic. If spoiled, it will stop crying as long as held; but if it has colic, the moving of it may cause it to stop for a short time, but it will soon commence to cry again with frantic spells. After we have determined that a baby has colic, it is well to endeavor to understand what colic really means.

Colic is a condition caused by irritation of the mucous membrane of the intestine, producing an increased formation of gas and a spasm-like contraction of a portion of the intestine. The result of these two factors is a segment of bowel, temporarily walled off, in which large quantities of gas has accumulated. Colic is met with most frequently in breast-fed babies. It is well known that breast milk favors the fermentative, rather than putrefactive, processes in the intestine. It is also well recognized that the fermentative products, under normal conditions, are not irritating to the intestinal wall.

In breast milk, there are two substances which favor fermentation, lactose and fat. Of these, there is but little variation in the quantity of lactose, but the most variable constituent of breast milk is fat. The fat is especially increased toward the end of nursing, and its proportion is very large when the quantity of milk is low. It has been shown that the substances produced by fermentation, which are most active in an irritative way to the intestinal mucous membrane, are the volatile fatty acids; namely, acetic, propionic, caprylic and butyric. Lactic acid is non-irritating.

Let us see what bearing these facts have on our subject. If we pour into the intestinal tract a solution rich in

fats, and should the fermentation process which, under these circumstances might be quite active, not be absolutely normal, there would be produced an excess of those irritating by-products of fermentation, already mentioned, resulting in an increased flow of mucus from the mucosa and an increased blood supply to the intestinal wall. In other words, a congestion would occur, an increased action of the intestine, spasm of the intestinal walls and, of course, pain and cramps.

Until there is a spasmodic contraction of the intestinal wall, with an increase in gas, there is no pain or colic. There are normal children that pass large amounts of gas and still have no pain.

We now have some definite indication for treatment of colic in infants. It is well to reduce the quantity of breast milk, either by shortening the length of time of nursing or lengthening the intervals between feeding, or both. There is another class of cases, where the milk is too rich in fat, and you would have to increase the liquid, in order to reduce the fat. We should try to increase the putrefaction by increasing the casein before nursing, either by giving dried casein, or by curdling skimmed milk and using the curd from one ounce of milk before each nursing. The culture of lactic acid bacillus can be given, thereby stimulating fermentation of the non-irritating fluid.

Colic is a condition which has always existed and will continue. We can give our anodynes or opiates and go peacefully on our way, assured that, whether the child is benefited or not, the family is pacified. This is not practicing medicine. It is simply temporizing with the cause and hoping that Nature will cure the ills in her own good time.

AN ORIENTATION*

An Essay on the Harrison Narcotic Act

WILLARD SMITH, M. D., F. A. C. S., *Phoenix, Arizona.*

The world is mad. A prominent feature of its debauch is that its intoxication is an auto-intoxication. It is greed-mad, speed-mad. It is going at a mad rush and its brakes will not work. A vicious circle has been established, and among the components of the endless chain of this circle we see such fallacies as high cost of living, high wages, financial megalomania, unionism, and a thousand other symptoms of a social insanity whose end cannot be foreseen. One common causative factor can be traced throughout all of these hectic manifestations. This factor is *speed*,—too much speed. It is conceivable that, in the end, the cause will be the cure. But before the cure can come, it is also probable that a cataclysm will befall which will make the story of the World War seem like a midsummer dream.

Our consideration of the trend of events is not destined to have any influence in altering the results. That is unalterable for it will be the logical and inevitable product of unchangeable natural law. We do not, and cannot, know and comprehend the entirety of natural law; but we may surely be pardoned if we choose to drop out of the procession for a while and watch it go by. Energy and driving force are admirable things, but sometimes a view from the roadside is instructive. Although our observations may not change in any respect the temper or trend of the mad mob, the view from the roadside may furnish us some instructive amusement.

Nature works by means which are sure, but they are very slow. Tornadoes and earthquakes seem to be merely accidents, not the powerful force which really is used in the production of great natural changes. They are hysterical outbursts and represent misdirected waste of energy, despite their apparent force. They and the similar

phenomena, such as floods and volcanic eruptions, are apparently waste products. They are unfruitful, non-constructive. Nature is fundamentally constructive. All phenomena which do not result in constructive results are mere byplays. They have a place in the great scheme, but their place is not immediately apparent. Perhaps they are the method Nature uses to mix up the dominoes in preparation for another game; more likely, they are the method Nature uses to spade her garden when getting ready to plant some new crop. Evolution is a slow process and cannot be hurried. Revolution is its direct antithesis. The maggot of unrest which works in the brain of the reformer is only another example of futile attempt to effect a short cut to the great end. Reformers come and go, but the great scheme continues to work itself out in its own way. Government exists only by the consent of the governed. Laws are made and changed and repealed and re-enacted according to the whim of the lawmakers who shrewdly derive from this kaleidoscope, a living. It has always been so. It probably always will be so. Sweeping enactments have always been followed by an equally wide swing of the pendulum in the opposite direction,—and back again, and again. In the end the pendulum comes to rest in the middle. Great noise and fuss has been made; certain men have been proclaimed great and fattened on their greatness. Others have been destroyed by their creations, like Frankenstein. The end has always been the same. Nature goes on her way serenely and smiles at the futility of the self-deluded reformers who have played into her hand by their madness. Her method of progress has always been by way of prolific production and then the elimination of the unfit. All these frantic reformations have had one common feature. They have weeded out from

*Read by title before the Medical and Surgical Association of the Southwest, at El Paso, December, 1919.

Nature's garden and effectually destroyed the unfit. In human affairs the weeding out of a few individuals, or a few hundreds of thousands of individuals, is all in the day's work with Nature. The "hand of the potter" often shakes, and the practical plan which Nature long ago adopted has been to discard the wry pots. Their component material is never wasted. Eventually it is used again, and maybe the product is more in accordance with the remote plan. If not, it is again junked and in time is used again and again. Just because a man has not measured up to the standard is no reason for grief on the part of Nature. She recognizes that he is a failure as an individual, but she also knows that he has served his purpose in producing certain combinations of elements which may again be used in the fabrication of another man. To the best of her products she only grants a tryout and then she junks them, and of their material she makes another and perhaps a better man, and profits by the experience. The wars and religions only carry on in a wholesale manner what we have told of individual experiments. France has gained more than the war. She has gained a well fertilized zone of territory within her former boundaries. From this will be fed men who will, we hope, have shorter canine teeth.

Men do not become drunkards because of liquor. That occurs because they are that kind of men. If they can't get the liquor, they will accomplish their purpose of self-destruction in some other manner. Prohibition may retard or divert but it cannot prevent the ultimate result. The garden must and will be weeded by one means or another. This is inevitable. It is debatable whether or not liquor may be a less objectionable agent than some others. All things are created for a purpose. Alcohol has its bad qualities, but it also has its good ones. It can certainly decimate the ranks of the unfit, and those who fall by its use thereby prove themselves unfit. We are now giving some of the other means a tryout.

Somewhere in the makeup of every man is a greater or less amount of com-

passion. In some it is infinitesimal; in others it is a predominant trait. If present in excess, the man becomes a sentimentalist; if too meagre, he is a brute. To none is given infinite wisdom. The lawmakers are made up of all these admixtures of compassion and wisdom in varying degrees. That is why their laws are of such varying degrees of effectiveness. Among lawmakers we must of necessity find those who have hobbies. Their pet schemes are pushed through and then comes the aftermath. Prevision is rare. Hind-sight is usually clearer than foresight. That is why laws are changed. If law were intrinsically right, or even if it merely approximated right, it would not change. So far back as history goes, and beyond, laws have changed. They have been made and tried, and impractical exceptions have been apparent. In time the exceptions became the majority and then the law changed. In the meantime, a multitude of the exceptions perished because of the law. It was hard for the exceptions, but in the end humanity benefited. A certain number of unfit had been eliminated. A better breeding stock survived and the race gained by it. All laws have had to pass through this process, not once, but many times. There are no new laws. Human experience has tried them all out, given up in despair, forgotten, and then tried again. An endless cycle, but a useful one in Nature's great plan to eliminate the unfit.

This brings us to the practical consideration of the Harrison Narcotic Law. The object of this law is to control and try to eliminate the *wrong* use of certain narcotic drugs such as opium and cocaine. It has attempted to provide for the proper and beneficent use of the drugs and, at the same time, to render them so difficult to secure for improper use as to eliminate, so far as possible, the devastation produced by their wrong use. The makers of the law did the best they could. So far, the effect has been to lessen, probably, the number of people who start on the wrong method of using the drugs. That is good. But the makers seemingly overlooked a very important point. They failed to make provision for the

wreckage. Such drugs, when used habitually, may, and often do, lead to crime. That crime is a result of mental deterioration in the drug user. Practically all such persons would have been criminal in any event. The drug has simply exercised a selective segregation. It has grouped those weak-willed people and made them weaker in their will power than they were before. Some of them might have lived through the normal course of their lives without recourse to crime, but the fundamental defect was there or they would not have become habitues. How, then, can this be turned to good account? The law has brought into view a very clearly defined group of abnormal people. This gives us a chance to deal with them. Most of them are only potential criminals. With no provision made for their physical segregation and restraint their criminality is prone to become kinetic. The great defect of the law is that it makes no provision for the restraint and treatment of these people. The crying need is for the establishment and maintenance of an adequate plant in which to work over this garbage,—to salvage what seems possible and to render the remainder innocuous. By no known means can more than a small proportion of the drug fiends be restored to normality. The reason is that they were not normal in the beginning. But such as can be saved should be saved. The remainder should be rendered innocuous. How? Certainly by the confinement in lock hospitals of those who are irreclaimable. These are not desirable breeding stock. They should certainly be unsexed; that would lessen the problem for the next generation. In confinement they would cease to be a menace either directly by example, or indirectly in a thousand other ways. It is clear that, inasmuch as the creation of the need came about by the enactment of a federal law, the same origin should be sought for the means by which to control this by-product of the law. These lock hospitals must be federal hospitals and are as much of a necessity as are federal penitentiaries.

They are not to be thought of as local institutions. The federal government cannot justly dodge its responsibilities in this matter.

Furthermore, the law is weak in that it delegates the true execution of the law to a vast multitude of profit-seeking merchants. Druggists as a class are an honorable and capable set of men. But they have, in common with all other groups of men, the misfortune to have among them many men whose honor is not unimpeachable. The exact execution of the law cannot be hoped for unless the narcotic drug trade be taken over completely by a federal government agency. The logical administrator of this trust is the Internal Revenue Department which is entrusted with the execution of the law. Then, and not until then, would it be possible to be certain that no habit-forming drug could be obtained for wrong use. No legitimate use of opium or cocaine would be thus interfered with. Those who have the right to use and who are morally competent to use the drugs would be assured of the proper supply, and there would be no surplus for wrong use.

Thus it appears that this law, while aiming at a great and good purpose, has really struck the problem in the middle and left both ends up in the air. The important thing is that it has made a beginning. A long step toward perfection and an absolutely necessary one is the absolute monopoly of the supply by federal agency and provision for care of the resultant wounded in appropriate federal hospitals. Surely a government which was able to secure billions of dollars for destruction, can spend a few millions for the rehabilitation of a large group of its own citizens who are in jeopardy because of its own act. The problem has lain a long while under cover. The federal law has brought it to light. Will our government fail in carrying the project through to its logical conclusion? We do not believe that it will leave its task unfinished.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

DR. KELVIN D. LYNCH, Mills Building, El Paso, Texas	Editor in Chief.
DR. PAUL GALLAGHER, Mills Building, El Paso, Texas.....	Associate Editor
DR. WM. T. JOYNER, Roswell, New Mexico.....	Associate Editor
DR. W. WARNER WATKINS, Box 1328, Phoenix, Arizona	Managing Editor

SUCCESS OR FAILURE

This is the third issue of SOUTHWESTERN MEDICINE under its new management. It is believed that the profession, generally, throughout the Southwest have noted an improvement,—some have commented favorably on it. This is gratifying to the management, but the ability to operate any such publication as this successfully does not rest with the management, but with the constituency for whom the journal is issued.

The journal will be a success just to the extent that we can secure *permanent advertisers*. The ability to secure permanent advertisers depends entirely upon the extent to which the advertisements are consulted by the readers of the publication and the advertisers patronized. In connection with another publication, an advertiser once offered to give a contract for a page ad for a year, provided a trial ad brought *five responses* out of the entire circulation. By personal appeal to five widely scattered doctors, these responses were secured, and the contract closed. We will not resort to such chicanery with this journal, but we recently had a whole page ad cancelled for the reason that

“no responses were received to ad from the territory covered.”

If YOU want this journal to succeed, look through the ads of this magazine when you contemplate purchasing anything from a house and lot to an automobile. We may not advertise what you want, but if we do, at least send an inquiry to the advertiser and state that the ad was seen in SOUTHWESTERN MEDICINE. This will be a *real* contribution to our success.

PUBLICATION OF PAPERS

Under the former arrangements for issuing the journal, it was not found possible to publish all the papers which were sent in, limited as the journal was in its available space. This has resulted in an accumulation of papers which are now being published and which will continue to appear for the next month or two. The journal will then be ready for the prompt publication of the material presented at the New Mexico and Arizona meetings, and will also be able to handle the papers read at the various county societies throughout the southwest. The County Secretaries are asked to secure and forward all such papers.

THE SHRINERS' HOSPITALS FOR CRIPPLED CHILDREN

One of the great philanthropies of this generation will be the hospitals for crippled children which are to be established by the Mystic Shrine organization at various points in the United States and Canada. An annual assessment, which will produce an income of more than a million dollars a year, has been voted, the expenditure of which will be in the hands of a body known as the Trustees of the Shriners' Hospitals for Crippled Children. Ten hospitals, of simple construction, but thoroughly equipped, have been authorized so far. They will be located in centers of population where the demand for such service to the crippled child is most felt. The first hospitals are to be built in Eastern and Middle Canada, California, Washington, Oregon, Louisiana, Missouri, Minnesota and New England. The patients will include children up to fourteen years of age who need skilled and free treatment for their deformities. They will be teaching hospitals, as far as possible, and the surgeon in charge, nominated by the Advisory Committee, is expected to give half his time to the hospital work and is to be paid for his services.

This is a very significant and hopeful movement; significant because it indicates a very suggestive trend of thought and resulting activity among a very large body of strong men; hopeful because it is an undertaking whose success is assured through the fact that it is backed by an organization with the will and the means to see it through.

W. W. W.

A NEW LOCAL ANESTHETIC

From time to time new anesthetics to take the place of cocaine have been pro-

posed, and to some extent used, but without utterly supplanting the older and rather dangerous drug. Now, however, the surgeon has a substitute that is a decided improvement. The new local anesthetic is called Butyn (pronounced *Bute-in*, with the accent on the first syllable). It is the discovery of Professors Roger Adams and Oliver Kamm of the University of Illinois and Dr. E. H. Volwiler of The Abbott Laboratories, Chicago.

The anesthetic has been passed by the Council on Pharmacy and Chemistry, of The American Medical Association. In his report, Dr. A. E. Bulson, Jr., for the Committee on Local Anesthesia, Section of Ophthalmology, said that it acts more rapidly than cocaine and its action is more prolonged. Less is required, and in the quantity necessary it is less toxic than cocaine. It has other advantages which make it highly useful, especially for eye work. A solution can be boiled without impairing its efficiency.

The Abbott Laboratories is supplying Butyn, in tablets (with and without Epinephrin) and 2% solutions, which may be had without narcotic blanks.

OUR ABSTRACT SECTION

It will be the policy, as far as possible, to have abstracts of articles from current literature, along the same lines as the original articles in the journal. Usually the abstracts and corresponding original articles will appear in the same issue, but, if not, the abstracts will appear in the following issue.

Therefore, when the original articles are read, turn to the Abstract Section and see if there is not something there bearing on the same subject, which will represent a discussion of the topic covered by the original article.

THIRTY-NINTH ANNUAL MEETING OF THE NEW MEXICO MEDICAL SOCIETY

HELD APRIL 29-30, 1921, AT THE CHAMBER OF COMMERCE, IN
ALBUQUERQUE, NEW MEXICO.

(NOTE.—The papers read at this meeting, which have not heretofore appeared in this journal, will be found in this issue and in the April issue. The following were the Addresses of Welcome and Responses, for this Albuquerque meeting of last April.)

The meeting was called to order at 10:00 A. M., by the President, Dr. H. V. Fall, of Roswell, N. M.

Invocation by Rev. Hugh Cooper.

ADDRESS OF WELCOME

W. A. KELEHER, City Attorney, Albuquerque.

Mr. President, Ladies and Gentlemen of the New Mexico Medical Association:

On behalf of Mr. Connell, Chairman of the City Commission, I am here today to extend to you an official welcome to the City of Albuquerque on behalf of her citizens.

We are genuinely glad that you are here with us and we trust that your meetings will be supremely successful. You should feel—and we hope you will feel—that while you are in Albuquerque you are in the hands of your friends. Perhaps in no other city of New Mexico, possibly in the United States, do the people of a community understand and appreciate the value of the services of a physician and surgeon more. You all know that the population of this town is made up very largely, I may say, of people who have come here from other places in search of health. They often hear the sentence of life or death passed upon them in the doctor's office or at the bedside, with just the same finality that a jury might pass a verdict upon whether a man shall be free or whether he shall die, in a court of justice.

We all know and feel here that lawyers have to do with things in a man's business. Preachers have to do with a man's soul, and we all know and feel that a doctor has to do with a man's

soul and with his body also, and that he is, in a large sense, a director of the destinies and lives of the people of his community.

We want you to feel here that the people are friendly to you, and that the city is friendly to you, and that the people desire that your meeting shall be the greatest possible success. If there is any cooperation that the city can offer you or anything that we can officially do to assist you in your work, we wish you would call upon us.

Recently I have been reading that book which has caused such a storm of criticism for and against it throughout the country,—one of the so-called best sellers, "Main Street," by Sinclair Lewis. Those of you who have read it will recall that the strongest character in the book is Dr. Kennacott. Those of you who have not read it might read it if you get the time. In the book is portrayed better than any recent writer has done, the service rendered by the so-called small town practitioner. The author has displayed great cleverness in portraying to the people of the country at large the difficulties, the sacrifices of the small town, or so-called, country practitioner. And we here in this city understand that better than people generally do.

Therefore, on behalf of Mr. Connell, who sends his best wishes and regards, and on behalf of the city at large, I wish to extend to you a hearty welcome, and want you to feel that we mean that you are welcome, and that you will find here all that you seek in the way of professional advice and exchange of ideas, and the good fellowship that I know is in your society.

I thank you.

CHAIRMAN: We will now have the Address of Welcome on behalf of the Bernalillo County Medical Society, by Dr. Van Atta.

ADDRESS OF WELCOME

On behalf of the Bernalillo County Medical Society.

DR. J. R. VAN ATTA, *President, Albuquerque*:

Mr. President, Members of the Society and Visitors:

Having been in close touch with our State Secretary during the preparation of the program which is to follow, I realize the necessity of brevity wherever it is possible during our two days' session.

The custom of having the entertaining society welcome you through its president is a habit or custom that might well be dispensed with, because we as a state society know we are welcome, it matters not where we meet.

The Barnalillo County Society is very glad indeed to welcome all of you to Albuquerque. However, we would feel hurt, both individually and collectively, if it became known that it was not until after these remarks that you knew you were welcome. In times past, so I am told, Albuquerque staged a series of diversions that could hardly be surpassed in any country anywhere. At present we find ourselves confronted with ever-increasingly active anti-saloon league, blue sky laws, etc. With these things confronting us we have sincerely tried to arrange things for your comfort and your entertainment, but keep in mind that the probabilities are that the Sixtieth Annual Meeting of our Society will look upon the Thirty-ninth as a very wild and hilarious affair.

At meetings such as ours the opportunity is afforded each of us to get together on our individual experiences of the past year, leaving behind us the numerous things in the way of petty jealousies and mistatements made to us by patients about our fellow physicians. For today, tonight and tomorrow let's forget these small matters and each

enter into our state meeting for our mutual good.

Again let me say that the members of the Bernalillo Society welcome you to Albuquerque and want to do everything possible to make your two days' visit a profitable as well as a pleasant one.

I thank you.

CHAIRMAN: The next address is by a voice which has been for some time silent in our Medical Society. We are glad to call upon Dr. Swope to give his response.

RESPONSE TO WELCOME ADDRESS

DR. S. D. SWOPE, *Deming, N. M.:*

Dearly beloved:

For more than a quarter of a century I have been coming to medical meetings at Albuquerque, and listening to the words of welcome from our genial hosts. The frosts of twenty-five winters have cooled the blood in the veins of many of our professional brethren; the varying winds of adversity have blown many from the orthodox altar of professional worth, and the shifting sands of time have covered some with the eternal blanket of oblivion.

Just a few of the old disciples of Esculapian potentialities linger near the center of the stage of professional activity, in spite of the insistent elbowing of the younger members of the fraternity of brotherly assistance and self-abnegation. I have been coming to Albuquerque so long that I sometimes feel that although the fire of youth still courses through my veins, I, too, may have outlived my usefulness in the councils of wisdom. Now, when I hear the burning words of welcome from my beloved colleagues, all my sad fears and fancies take flight.

Welcome to Albuquerque! Why, we are only coming to our old home circle and you have only said: "Hello, brother; come in and take your place in the family group about our glowing fire-side. Mack, bring on the apples and popcorn,—the gang's all here."

To be sure you have told us that the latch string hangs out and you have

presented us with the key to the pantry and the cellar, but pshaw, most of us know the way up the back stairs, know which windows are not fastened down and could identify the old cider jug in the pantry by the sense of touch alone.

However, notwithstanding our feelings in coming back to the shelter of our old professional roof-tree, your words of welcome fall like the sweet strains of a symphony on our receptive ears. No prodigal ever enjoyed his welcome more than we do. No prodigal could ever enjoy the feast of reason and the hospitality of the fatted calf more than we will. Your words of welcome have filled our cup of happiness to overflowing, and as the representative of the members of the professional family who sometimes exist in other parts of the great commonwealth of New Mexico, and other states, but really live when they come to Albuquerque, we thank you with all our hearts.

CHAIRMAN: I will ask Dr. Peters to conduct our incoming President, Dr. Chester Russell, to the platform and introduce him to the Society, after which he will read his annual address.

(Dr. Russell is escorted to the chair.)

DR. PETERS: It gives me great pleasure to introduce the incoming President from the only section of New Mexico which, under the Prohibition Act, still flows,—Dr. Russell, of Artesia.

DR. JOSEPH MacDONALD
of New York City

In the death of Dr. Joseph MacDonald, managing editor and publisher of *The American Journal of Surgery*, the world of medical literature has suffered a great loss. It was due to the executive genius of Dr. MacDonald, for many years secretary of the American Medical Editors' Association, that this organization made itself felt as a force in the field of medical publication. Dr. MacDonald's life was practically devoted to medical journalism, rising from office boy to manager in the office of the *International Journal of Surgery*. He took his degree in medicine while still holding this latter position. In 1905, he established *The American Journal of Surgery*, in association with Dr. Walter M. Brickner. In the Medical Reserve Corps, in which he was an officer since 1909, his service was that of directing the propaganda amongst the medical men of the country, for enlistment in the Corps. Shortly after his discharge, he suf-

fered a cerebral hemorrhage, from which he partially recovered, only to succumb to a second hemorrhage, in his office, on January 7th.

DR. WALTER LINDLEY

In the death of Dr. Walter Lindley, of Los Angeles, one of the notable men of the West passed from us. He was one of the pioneers, having practiced in Los Angeles for more than forty years, witnessing the growth of that city from a village of 5,000 people to more than half a million. He helped organize the Los Angeles County Medical Society and was one of the incorporators of the University of Southern California, Medical Department, and the California Hospital. Dr. Lindley was an author of note, his works embracing books and essays on many subjects, aside from Medicine.

Dr. John Ashworth Standring, El Paso, Texas, graduate of Denver College of Medicine, 1899, for some time Medical Director of the Southern Baptist Sanatorium, El Paso, died at his home January 1, 1922, at the age of 54 years.

Milk is the universal food. In some cases it is hard to handle because the acid stomach forms indigestible clots. This curdling may be overcome without altering the value of the milk. In chymogenized milk the casein is precipitated in flocculent particles. In this form the casein is easily digested. Where the whole milk is wanted, boil, let cool to 105 degrees F. and add Chymogen.

If whey is wanted, heat the milk to 105 degrees F., add Chymogen. When the curd is set, cut, drain off whey and use. Chymogen is from the Armour Laboratories.

THE NEW MEXICO MEETING

The fortieth annual meeting of the NEW MEXICO MEDICAL SOCIETY will be in Gallup, on April 28th and 29th. This meeting should attract the men from the northern part of the state in large numbers, and the loyal men from the other portions of the state will be present in the usual proportion. It is hoped that the Arizona men along the Santa Fe main line, especially, will make it a point to attend this meeting.

An excellent program is in course of preparation by Dr. Stofer, Secretary of the McKinley County Medical Society, details of which will appear next month.

NEWS SECTION

ALBUQUERQUE NEWS ITEMS (New Mexico)

The Medical profession of the Southwest join with the Bernalillo County Medical Society, in extending sympathy to Dr. M. K. Wylder, of Albuquerque, President of The Medical & Surgical Association, on the loss of his wife.

Mrs. Wylder, one of the most prominent and popular women of Albuquerque, died on January 15th, from epidemic encephalitis after a brief illness of only two weeks. In addition to her husband, she is survived by a five months' old boy.

Dr. E. C. Matthews, of Albuquerque, is confined in the hospital with a fractured pelvis, sustained when his automobile was struck by a logging train just outside the city, on February 6th.

YAVAPAI COUNTY MEDICAL SOCIETY (Arizona)

At the annual meeting of this Society, held on January 12, 1922, the following officers were elected for the year:

Harry T. Southworth, President; James Thom, Vice-President; C. E. Yount, Secretary-Treasurer; Censors, A. C. Carlson, C. R. K. Swetnam and R. N. Looney; Delegates to Arizona Medical Association, A. D. Wilson and Rembert Thigpen.

The Society reports the death, on December 26, 1921, of Dr. Wm. N. Burdick, one of their members. Dr. Burdick was a graduate of the University of Michigan, class of 1873, and had been located in Prescott several years. The cause of death was peritonitis, with ruptured aneurism of the aortic arch as the immediate cause.

THE YAVAPAI COUNTY MEDICAL SOCIETY

(Prescott, Arizona.)

The County Society meeting held February 21st was a joint meeting with the Medical Officers of Whipple Barracks.

The meeting was held at Whipple, and there were present from the Yavapai County Medical Society, Drs. Flinn, Looney, Moore, Southworth, Swetnam, Wilson, and Yount. From U. S. Veterans' Hospital No. 50, there were present, Drs. Allen, Alee, Bell, Brooks, Arntzen, Dix, Dupree, Christian, Herrick, Mattice, Pemberton, and Rassmaussen.

We followed our usual order of program, as we have found this very successful during the past year and a half, and I will go into some detail concerning the method, as it may be of some service to other County Societies. We have a committee of four on Program, two members from our County Society and two from the Public Health Service, and use the

Cabot Case Histories, as published by the Massachusetts General Hospital of Boston. One member of the committee selects the histories for the evening. One doctor is chosen to present the case, and two to open the discussion. Three cases constitute an evening's work. The histories are sent out two weeks before the meeting in order that the "essayists" may have ample time for preparation. At the meeting the Case History is read by the doctor in charge of the case, then all present except the doctor holding Dr. Cabot's discussion of the case, present their diagnoses in writing. The secretary tabulates these while the doctor discusses the case and makes his diagnosis. The two doctors chosen for discussion then open the discussion on this case, and after that the case is open to general discussion, and the result of the votes on the diagnosis are then read to the meeting by the secretary. Three papers thus presented constitute an evening's work. We have found this method highly interesting and instructive, and while we have considered various innovations we adhere practically to the main idea, and have been pleased and surprised at its continued success. It is now in its second year.

C. E. YOUNT,
Secretary.

EL PASO COUNTY MEDICAL SOCIETY NEWS NOTES

Dr. F. P. Miller has recovered from his recent illness and is again at his office.

Dr. L. B. Auerbach is convalescing from a severe illness.

Dr. Wirt Bradley Dakin addressed the Society at the regular meeting, February 6th, on "The Operability of the Senile Prostate."

The following have recently been admitted to regular membership: Drs. S. E. Wilson, J. D. Riley, P. R. Outlaw and Harry Leigh, all of El Paso, and the membership of Dr. E. A. Frechet of Parral, Mexico, has been transferred from the Dallas County Medical Society.

The following officers of the Medical Corps stationed at the William Beaumont General Hospital, Ft. Bliss, have been admitted to honorary membership: Lt. Col. W. R. Eastman, Maj. Thos. E. Scott, Maj. Henry F. Lincoln, Maj. Harry R. Oliver, Maj. J. J. Madigan, Capt. Wm. W. McCaw, Capt. R. S. Loving, Capt. Wm. J. Froitzheim, Capt. Jesse C. McKean, and Capt. H. P. Calmes.

ST. MARY'S HOSPITAL STAFF MEETINGS (Phoenix, Arizona)

At the annual meeting of the Staff, held in the lecture room of the Hospital on January 12, 1922, all the officers of the Staff were re-elected for another year. These are Dr. Win Wylie, Chairman; Miss Marcum, Secretary;

Drs. A. M. Tuthill, W. A. Schwartz, Kimball Bannister, C. S. Vivian, W. W. Watkins, Executive Committee.

Dr. Willard Smith read a paper which was a combined eulogy of the work of Mother Paul, and a criticism of the failure of the Staff to carry into effect her wishes and plans.

The annual banquet of the Staff was held at the Country Club, on February 9th, attended by about twenty-five members.

EL PASO COUNTY MEDICAL SOCIETY MEETING

The El Paso County Medical Society met February 6, 1922, with a total attendance of 70 members and visitors.

Dr. Wirt Bradley Dakin, of Los Angeles, read a paper, "The Operability of the Senile Prostate," and showed a motion picture of a Prostatectomy and demonstrated about 80 interesting prostate specimens.

Dr. Dakin opened his interesting paper by cautioning the general practitioners against discouraging old men with enlarged prostates by telling them that operation is, in many cases, of no benefit and is dangerous, for with the present perfection of technique these facts are no longer true. He illustrated this by citing two cases of patients over the age of 80, both of whom had been advised that they were too old and couldn't stand operation, yet both of them went through operation with no difficulty and recovered completely. He stated that the usual contraindications to prostatectomy as generally quoted are: age, uro-sepsis and asthenia, cardio-vascular-renal changes, and where there is reason to think incontinence will follow. These contraindications were discussed and in the opinion of the speaker, age, per se, is not a contraindication; that uro-sepsis, asthenia, and cardio-vascular-renal disturbances require careful preliminary "building up" treatment, through flushing of the system accomplished by compulsory ingestion of large amounts of water, bladder drainage, by retained catheter, if necessary, etc., and that incontinence does not occur after careful operation except in some cases of malignancy. Statistics were quoted which showed that a large per cent of cases recover after operation while at least one-half of the non-operated cases die from two to three years after the onset of symptoms. The operation of choice is the supra-pubic and betterment of technique with increased attention to preoperative treatment has so reduced the mortality that at present in the hands of experienced operators it does not run over 2.5 per cent in cases that require preliminary treatment and is practically nil in those cases not requiring preliminary treatment.

The motion picture demonstrated preliminary bladder drainage, the systematic ingestion of water, the induction of spinal anesthesia (used very rarely) the operative technique and the after care of the patient.

The paper was discussed by Drs. J. Vance, K. D. Lynch, W. R. Jamieson, B. W. Wright, H. Crouse, W. L. Brown, and Paul Gallagher.

Dr. H. Crouse demonstrated a specimen of the caput coli with a portion of the ileum and lower two-thirds of the ascending colon, removed at operation from a patient who nine years before was operated and the appendix removed. This was done by a very capable operator who noted the diseased condition of the colon but apparently did not think it wise to interfere. Two years later the gall bladder was removed by another surgeon who also sutured the stomach to the abdominal wall. The operative work done by Dr. Crouse was done in two stages. At the first the stomach was freed from the abdominal wall with considerable difficulty and a posterior gastro-enterostomy done because of duodenal ulcer. Five weeks later the second work was done, at which time the demonstrated specimen was removed. The specimen showed an internal diverticulum which did not show externally while the lower part of the colon and cecum was the seat of a large chronic ulcer. The symptoms exhibited by the patient were persistent irritation of the bowels, pain, diarrhea, etc., which had not been relieved by the two former operations.

Dr. S. E. Wilson and Dr. J. D. Riley of El Paso were accepted for regular membership, and the membership of Dr. E. A. Frechet of Parral, Mexico, was transferred from the Dallas County Medical Society.

EL PASO COUNTY MEDICAL SOCIETY

The El Paso County Medical Society met February 20, 1922, with 61 members and visitors present.

Dr. W. R. Jamieson reported a case of supernumerary kidney in a man who, in 1919, was operated and drained for a perinephritic abscess, with later removal of the kidney. A urinary fistula developed and a third operation was performed, at which time the ureter was tied on the theory that the urine was backing up from the bladder. The fistula persisted and at a fourth operation the ureter, together with a small piece of attached kidney tissue, was resected. The fistula still persisting, the fifth operation was performed and a supernumerary kidney was removed from above and posterior to the normal kidney site. The operator at the original nephrectomy felt a mass in this location but, thinking it the supra renal, left it. The last operation was performed in January last and there has been no recurrence of the fistula.

Dr. K. D. Lynch reported a case of a man who, three years ago, had what was diagnosed as renal colic. After the attack subsided there persisted what was described as a dull pain over the left kidney. X-ray was negative for stone, and cystoscopic was negative except for a slight chronic cystitis. Pyelogram showed an obstruction at the uretero-pelvic junction of the left kidney with moderate hydronephrosis. In Dr. Lynch's opinion this was due to old adhesions. The case, which belonged to the War Veterans Bureau, was referred to the William Beaumont Hospital for exploratory operation.

Dr. B. W. Wright reported several cases, as follows:

A man, working at Dawson, New Mexico, seen February 11th, had noticed blood in the urine three months previous. No attention was paid to this and the patient continued working until two weeks ago when there was a severe hemorrhage from the bladder. When seen by Dr. Wright one week later, the patient was slightly cachetic, the skin and conjunctivae had a pale yellow color, the liver was enlarged and there was some rigidity and tenderness over the organ. The prostate was much enlarged and tender. Cystoscopic examination showed an ulcerated and bleeding tumor the size of a pigeon egg just inside the vesicular neck with several smaller tumors that looked malignant on the trigone. A small piece of the large tumor was resected and proved to be carcinoma and the diagnosis of carcinoma of the prostate with liver metastasis was complete. Poor prognosis was given and the patient died one week later. Autopsy showed two-thirds of the bladder involved with large tumor masses in the liver.

The second case was that of a man, age 40, seen for the first time last April. Family and personal history were negative with the exception of several attacks of specific urethritis during the past seven years. Ten months previous, while riding a bucking horse, he felt a "tearing pain" in the bladder and began passing blood in the urine; the hematuria persisting at irregular intervals. Cystoscopy in April showed a villous tumor on the left lateral bladder wall. This was diagnosed as villous papilloma. On April 8th, fulguration was started and after eight treatments the only change noted in the tumor was the disappearance of the villae. Malignancy was, of course, suspected and under ether anesthesia the tumor was destroyed by the actual cautery. Specimen examination showed carcinoma. The convalescence was complicated by pneumonia but recovery was complete and to date there has been no recurrence of the tumor.

The third case reported was that of an intra-urethral chancre which had been diagnosed and treated elsewhere as gonorrhea because of a purulent discharge. Spirochetes were found in the scrapings from the lesion and the case cleared up under salvarsan.

Dr. Paul Gallagher reported a case of tetanus resulting in death four hours after the onset of symptoms. The case was that of a child whose left hand, right ear, face, arms and chest had been severely burned and lacerated by the explosion of a percussion cap. The accident happened in the country on February 11th and on the 12th, after the patient reached town, the wounds were cleaned, the lacerated fingers amputated and 1500 units of tetanus anti-toxin given. The patient did fairly well until the 6th day when at 2:00 p. m. the first symptoms of tetanus were noted and death resulted from this cause four hours later.

Dr. B. F. Stevens reported a case of a

woman, age 60, who nine years previous, vomited blood shortly after a hearty meal. There was no further trouble until one month ago she had a similar experience and this was repeated several times over a period of three days. There were no other signs or symptoms of trouble. All food by mouth was stopped for two days and then one tablespoon of soft food was given which was immediately of soft food was given which was immediately three times and death resulted during the last hemorrhage. Autopsy showed a small aneurism of one of the gastric vessels on the lesser curvature.

Dr. K. D. Lynch read a paper, "Some Unusual Urological Cases," the cases discussed being Alkaline Incrusted Cystitis, Leukoplakia of the Kidney and Malakoplakia of the Bladder. This paper will be published later. Discussed by Drs. W. R. Jamieson, B. W. Wright and W. W. Waite.

Dr. J. W. Cathcart gave a few remarks concerning the cancer question illustrated by Dr. J. M. Martin's (Dallas) excellent motion pictures showing a large number of cancer cases with suitable titles showing the necessity of early diagnosis and complete removal of all suspicious lesions.

Dr. N. W. Jenkins, of Denver, showed by picture and slides the present day method of manufacture of smallpox vaccine. This was done so that the medical profession should thoroughly understand the technic in case the necessity arose for combatting anti-vaccinationists such as was necessary during a recent outbreak of smallpox in Denver.

Drs. Howard Thompson and H. H. Stark were appointed as a committee to compile and gather medical history of this section to be handed to Dr. F. Paschal of San Antonio for preservation and later incorporation in the proposed Medical History of Texas.

The membership of Dr. R. A. Wilson of Terlingua, Texas, was transferred from the Ector-Midland-Martin-Howard County Medical Society.

Dr. T. C. Liddell of El Paso was admitted to regular membership.

E. W. RHEINHEIMER,
Secretary.

NEW MEXICO

Dr. Stephan of the American College of Surgeons has spent two days in Albuquerque, looking over the hospital situation. St. Joseph's Hospital gave a banquet in honor of Dr. Stephan, having as guests the local medical men.

The Chaves County Medical Society has elected the following officers for 1922: President, Dr. E. M. Fisher; Vice-President, Dr. O. R. Haymaker; Secretary-Treasurer, Dr. C. M. Yater.

Regular meetings of this Society are held every Tuesday evening, except during the months of June, July and August.

The regular January meeting of the New Mexico State Board of Medical Examiners was held at the State Capitol in Santa Fe, January 9th and 10th, with the following members present: President, Dr. W. T. Joyner; Secretary, Dr. R. E. McBride, Dr. H. A. Miller and Dr. J. A. Massie. The following appeared before the Board and were granted license:

Hagerty, Thomas Walter, (Northwestern), Clovis, N. M.; licensed by diploma.

Alexander, H. S. A., (U. of Edinburg), Santa Fe, N. M.; by diploma.

McBride, John, (Dartmouth), Estancia, N. M.; by diploma.

Rogde, Jacob, (Northwestern), Santa Barbara, Mexico; by diploma.

Miller, James Kearney, (U. of Nashville), Columbus, N. M.; by diploma.

Hutchinson, A. F., (Michigan), Durango, Colo.; by diploma.

Abraham, Edwin D., (Rush), Farmington, N. M.; by diploma.

Jenness, B. F., (Dartmouth), Ruidoso, N. M.; by diploma.

Smith, James A., (Vanderbilt), Roswell, N. M.; by diploma.

Middlebrook, Robert, (Jefferson), State College, N. M.; by diploma.

MARICOPA COUNTY

Regular Meeting of the Maricopa County Medical Society, February 16th.

Dr. T. L. Gilmer, the famous oral surgeon of Chicago, was on the program for a paper on 'Focal Infection.' Owing to the illness and death of his son-in-law, Dr. Ames, he was unable to attend. The Maricopa County Medical Society looks forward to Dr. Gilmer's next visit to Arizona, when we hope he will favor us.

Dr. E. W. Phillips of Phoenix presented a paper on "Hay Fever in the Salt River Valley and Treatment of Cases with Pollen Extracts." This paper is to be published in full in this journal and will not be reported at this time. Dr. Phillips brought out the great complexity of the hay fever problem in the Salt River Valley and the dissimilarity between the causative agents here and in the Eastern states. The plants were listed, showing the percentages of patients who react to the various pollens and their seasonal distribution. Case reports were presented showing results of treatment, etc. This paper should be of great value throughout the Southwest, as it attacks the problem in a scientific manner and, with slight variations for different localities, is applicable over considerable territory.

Dr. W. W. Watkins presented a large number of interesting x-ray plates on kidney and lung conditions.

IODALBIN

The iodides have held their ground in professional esteem not because but in spite of the attitude of the patient toward them. They are disagreeable to take, and yet in many cases prolonged courses of treatment are necessary. An iodine compound that does not dissolve in the stomach, and is therefore without irritating effect upon that organ, is marketed by Parke, Davis & Co., under the name Iodalbin—an albuminate or protein compound of iodine.

Iodalbin contains about 22 per cent of iodine in organic combination—not a large proportion as compared with the iodides, and yet the dose is about the same, for the reason, as stated by the manufacturers, that the iodine in Iodalbin remains in the tissues, accomplishing its therapeutic mission, much longer than the iodine in inorganic combinations.

Iodalbin is put up as a powder in ounce vials and in 5-grain capsules.

THE NEWER MEDICINAL CHEMICALS

On Friday evening, January 6th, Dr. Alfred S. Burdick, President of The Abbott Laboratories, Chicago, delivered an address before the Chicago Branch of the American Pharmaceutical Association, on the "Newer Medicinal Chemicals." The rapid growth of American chemistry through cooperation of all research agencies in this country, was emphasized by the speaker.

Concrete examples of American achievements in synthetic chemistry were recited, and a plea made for the support of the medical and pharmaceutical professions to preclude the possibility of our again becoming dependent upon foreign sources for chemical supplies. The history of Arsphenamine, Barbitol, Cinchophen, Neocinchophen, Chlorazene, Procaine, the Benzyl Esters, and other synthetic medicinal chemicals was outlined. Announcement was also made of a number of new chemical bodies recently developed, and others on which research work was now being done by The Rockefeller Foundation, various Universities, the American Medical Association, and The Abbott Laboratories.

In conclusion, Dr. Burdick urged both physicians and pharmacists to prescribe and dispense medicinal chemicals by the newer American names, rather than to perpetuate the prewar dominance of foreign synthetics. This position was supported by the Council on Pharmacy and Chemistry of the American Medical Association, in whose laboratories American medicinal products have been analyzed and found to be equal and in some cases superior to foreign-made products.

BOOK REVIEWS

OPERATIVE SURGERY, by *J. Shelton Horsley, M. D., F. A. C. S.* Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. With 613 Original Illustrations. 1921. C. V. Mosby Company, St. Louis. Price, Cloth, \$10.00 net.

This work is not an encyclopedic review of the operations that have been recommended for various conditions. Instead, it is rather a review of the author's experience, or an expression of his judgment as to the best surgery to meet the requirements of the case. In accordance with this idea the book is written in a narrative style rather than the outline character that seems typical of so many operative surgeries. This feature of the work is particularly pleasing, and the next forms interesting reading. The ideas of the author find frequent expression and one is impressed with his constant endeavor to lead the reader into paths of correct judgment to meet the requirements of the individual case. His descriptions of blood vessel surgery, his ideas regarding surgical drainage and objections to bone plates are especially worthy of mention. Altogether it is a very readable and a very satisfactory work.

E. B. R.

PRACTICAL CHEMICAL ANALYSIS ON BLOOD.—A book designed as a brief survey of this subject for physicians and laboratory workers. By *Victor Carl Meyers, M. A., Ph. D.*, Professor of Pathological Chemistry in the New York Post-Graduate Medical School and Hospital. Illustrated. St. Louis: C. V. Mosby Co. 1921. Cloth, 121 pages. Price \$3.00.

Rapid advances in the study of blood chemistry have made this subject one of increasing importance in the diagnosis and treatment of diabetes, nephritis and a number of other diseases with deranged metabolism. This work is essentially a laboratory manual but it also includes some discussion of the clinical application of laboratory findings. Unnecessary information is eliminated and the author has selected the one or two most satisfactory methods for the various determinations. The steps of each test and the apparatus required are discussed in detail. The work should prove of considerable utility to the laboratory worker in this line.

E. A. D.

A PRIMER FOR DIABETIC PATIENTS. A brief outline of the principles of diabetic treatment, sample menus, receipts and food tables. By *Russell M. Wilder, M. D., May A. Foley and Daisy Ellithorpe*, Dietitians, The Mayo Clinic. 12mo. of 76 pages. Philadelphia and London: W. B. Saunders Company, 1921. Cloth \$1.50.

Physicians treating diabetes seem of the opinion that the patient should be taught as much concerning his disease as he is able to comprehend. This little book is intended for the patient's use and it is well styled a primer as it contains only the simplest facts and briefest instructions. The patient is taught to use the metric system in weighing his food;

he is taught to make qualitative urinary tests for sugar and diacetic acid, and is instructed in the care of teeth and skin and in the general measures against threatened coma. The remainder of the book is devoted to diet menus and recipes for the preparation of food. This book can, with advantage, be placed in the hands of every diabetic.

E. A. D.

PRINCIPLES OF HYGIENE. A practical manual for Students, Physicians and Health Officers. By *D. H. Bergey, M. D., Dr. P. H.* Assistant Professor of Hygiene and Bacteriology, University of Pennsylvania. Seventh Edition, thoroughly revised. Octavo of 556 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1921. Cloth \$5.50.

Seven editions of this work indicate that it has served its intended purpose as a text-book for students and a guide for physicians and health officers. The book takes up the various health problems—building, water supply, sewage and garbage—as well as matters of personal hygiene. The communicable diseases and prevention of their dissemination by disinfection, quarantine, etc., are fairly well treated. The subject matter has been brought up to date in the new edition.

E. A. D.

ANATOMICAL NAMES, especially the Basle Nomina Anatomica ("BNA"), by *Albert Chauncey Eycleshymer, B. S., Ph. D., M. D.*, head of the Department of Anatomy, University of Illinois, assisted by *Daniel Martin Schoemaker, B. S., M. D.*, Professor of Anatomy, St. Louis University, with biographical sketches by *Roy Lee Moodie, A. B., Ph. D.*, Assistant Professor of Anatomy, University of Illinois. Wm. Wood & Co., New York. Cloth, \$4.50 net.

The object of this volume is to standardize the nomenclature of anatomical names. The authors state that over 50,000 names have been given to some 5,000 structures. Every student has struggled with the difficulty of having several names applied to the same structure. The BNA classification has resulted from the work of the German Anatomical Society begun in 1887. It would certainly be a great advantage to have some uniformity of nomenclature, but it would seem that this must originate in the medical schools as the busy physician has little time for this sort of study.

The book is divided into three sections. The first takes up the classification by regions of the body followed by explanations for the nomenclature. The second is a series of short biographical sketches which make up a very interesting part of the book. Here one can look up the anatomists from Aristotle and Hippocrates to John Hunter and Alexander Skene. The third part consists of an index and synonym register and gives the BNA terms with Latin and English equivalents or synonyms to the number of nearly 50,000. This index occupies 400 pages.

PRACTICE OF MEDICINE, a manual for students and practitioners, by *Hughes Dayton, M. D.*, New York. Fourth revised edition. Lea and Febiger—Philadelphia and New York. Price \$2.25 net.

This small text of 328 pages in the nature of a manual is intended to cover the subjects of general interest in the entire range of medical practice. This, of necessity, means that the principal discussions are limited to the commoner subjects, and that diseases seen infrequently are condensed into little more than outline form. The chapter on tuberculosis is rich in the data contained. Diabetes is covered fully and the value of blood sugar determination properly stressed. The circulatory diseases are well treated. It forms a handy volume for ready reference.

A. M.—R.

Abstracts From the Current Literature

A SYMPOSIUM ON SYPHILIS

Before the Medical Society of Pennsylvania, October 5, 1921. Abstracted from *Penn. Med. Jour.*, January, 1922.

MODERN CONCEPTIONS OF THE TREATMENT OF SYPHILIS: By *J. Frank Schamberg*.

The purpose of treatment is to exterminate every spirochete in the body; the most powerful chemical weapon which we possess for this purpose is that known as "606," salvarsan, arsphenamine, or one of its derivatives. Mercury must still be regarded as a remedy of value, but occupies a position of secondary importance. (Not all syphilologists agree to this.—Ed.). Mercury, in the highest dosage tolerated by man, in a single or several succeeding administrations, fails to destroy spirochetes in external lesions. When bichloride (1/6 gr.) or calomel (2/3 gr.) is injected daily for three days, spirochetes are still present in chancres, while a single dose of .2 gm. of neoarsphenamine invariably leads to complete disappearance of the spirochetes. Thousands of cases have been cured by mercury alone and by arsphenamine alone; the spirochete is vulnerable to both drugs, and theoretical and practical considerations alike demand that arsphenamine and mercury both be used.

On the basis of his experience, this author believes it is possible to cure virtually all cases of seronegative primary syphilis by the use of the arsphenamines alone, and that a high percentage of secondary syphilis can be cured by weekly injections of arsphenamine or neoarsphenamine alone, although some cases run on with persistent positive Wassermanns. Ten injections of arsphenamine appear, in general, to be equivalent to about fifteen of neoarsphenamine. (This author is more sanguine about the use of arsphenamine alone than most writers.—Ed.)

Treatment of Exposed Individuals: In an individual seen within 24 to 72 hours after exposure to a known active syphilitic, two in-

travenous injections of neoarsphenamine, in .6 to .9 gram doses, should suffice to abort the infection. If a longer time than this has elapsed, it is better to await the finding of the spirochetes in the initial sore before instituting treatment.

Primary Syphilis: As general system, two injections of neoarsphenamine .9 gm., or arsphenamine .3 gm. twice a week for two weeks, then once a week for six weeks. At the same time, inunctions of 50% mercurial ointment on alternate days, until thirty have been used. Rest three weeks and repeat the course. Another rest of three weeks and, if Wassermann is negative and no symptoms are present, mercury by mouth three weeks out of every four for a year, or three or four courses of mercurial injections or inunctions during the year.

Secondary Syphilis: Treatment the same only more of it; three courses of arsenical and mercury, as above, during first year and two during the second year, with mercury by mouth during the intervals.

Tertiary Syphilis: In tertiary syphilis, the principles of treatment are different. Rapid cure is not to be looked for, and intensive treatment is to be avoided. Moderate doses of neoarsphenamine, followed by moderate doses of mercury, supplemented by iodides. Treatment should not be pushed at the expense of the patient's physical well-being.

THE TREATMENT OF VISCERAL SYPHILIS: By *Thos. McCrae*.

In treating visceral syphilis, there are two parts to the problem,—to eradicate the chronic spirochetal infection, and to restore the organs to normal function.

It does not seem possible, in any given case, to be certain that we can kill out the spirochetal infection; in treating visceral syphilis, we hope to kill out the infection, but it is wiser to regard it as being always latent. A man may harbor spirochetes and yet be in perfect health, without clinical signs of syphilis.

In treating the tissue changes, much depends on the extent of the changes present when treatment is begun, but usually we can aid materially in the restoration of function.

In regard to the indications for treatment, the Wassermann should not be a hard and fast guide. If clinical signs are present, the negative Wassermann should be disregarded.

As to choice of drugs, as our knowledge stands today, both should be given. If there is a choice of only one, this author's choice would be mercury. In treating visceral syphilis, the dose should always be small and increased gradually. In syphilis of the liver, the arsenicals are contraindicated; in using mercury, a careful watch should be kept over the kidneys and the blood.

TREATMENT OF NEUROSYPHILIS: By *H. C. Solomon*.

There is, as yet, no definite answer to the question as to why some patients develop

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WE DESIRE TO CONFER and cooperate with the medical profession regarding the use of Radium in appropriate cases.

(Continued from page 124)

neurosyphilis and others do not. We know that cases which receive treatment from the time of the primary sore develop neurosyphilis,—meningitis, tabes, paresis. They develop neurosyphilis sometimes early, sometimes late; they develop it during treatment or years after treatment, and whether the treatment was arsphenamine or mercury or both. We do not know why. Several case histories are given to illustrate points in the paper, which presents the following conclusions:

1. Neurosyphilis frequently develops during the course of the usual routine antisyphilitic treatment, which must then be considered inefficient.
2. More intensive general treatment might be efficient.
3. Some patients do not respond to general treatment, even given to the patient's tolerance.
4. Some of these will react favorably to intraspinal treatment.
5. Some do badly under a combined general and intraspinal treatment.
6. Some do well with intraventricular injections.
7. No one method is best for all cases, but may be best for a given case.
8. Mercury and iodides may succeed where arsphenamine fails.
9. In general paresis, especially, a combination of all our present methods is not efficient.
10. The spinal fluid is not the major criterion of success or failure; patients whose fluids remain pathological may show clinical recoveries; also, those whose fluids become negative may succumb to neurosyphilis.
11. The usual treatment is far below the patient's tolerance. Intravenous arsphenamine and intraspinal injections are rarely given up to the point of tolerance.

TRANSFUSION—METHODS AND INDICATIONS: *Lundblad*, Penn. Med. Jour., January, 1922, p. 245.

This writer argues for the direct method, as opposed to the citrate method. The indications given by him are: (1) the obligatory indication of progressive anemia due to hemorrhage from whatever cause. Among other indications are pernicious anemia, sepsis, unclassifiable anemia. An unusual observation is that he does not consider a Wassermann on the donor as absolutely essential, but states that it should be done whenever possible. His contention for the direct method was opposed in the discussion.

UNRESOLVED PNEUMONIA: *Piersol*, Penna. Med. Jour., January, 1922, p. 249.

An interesting development, since the influenza epidemic, is that bronchopneumonia now predominates over lobar pneumonia in adults, and the causative organisms are varied, with the pneumococcus in the minority.

The evidences of unresolved pneumonia are the persistence of physical signs, the subsidence of constitutional symptoms, especially

fever, and the x-ray picture of a bronchitis or peribronchitis with marked thickening about the hilum.

In differentiating unresolved pneumonia from empyema, massive or loculated, interlobar abscess or lung abscess, this latter group of more serious conditions show *continuation* of fever, which may become irregular or remittent, and the patients continue to be obviously sick. Pain, cough, dyspnea and expectoration may continue, with irregular physical signs.

Carefully exclude all the more serious possibilities before making diagnosis of unresolved pneumonia. If a case of pneumonia continues to have fever, increased pulse rate or dyspnea, and a leucocytosis, it is an *empyema*. There are no typical empyema fever curves, and no pathognomonic signs. Even over considerable collections of pus the breath sounds may be heard and may even be bronchial.

PROTRACTED UNILATERAL BRONCHOPNEUMONIA OF LOBAR DISTRIBUTION: *Riesman*, Penna. Med. Jour., January, 1922, p. 255.

There is a peculiar form of chronic inflammation of the lung characterized by involvement of one lower lobe, with a slow protracted course, low fever and cough.

The disease may start acutely, and persists for weeks and months, with cough, slight fever and tendency to tire easily, with the persistence of a superabundance of moist, crackling rales limited to a lower lobe. The x-ray findings are usually slight in contrast to the marked physical findings.

(NOTE.—In the discussion of the papers of Drs. Piersol and Riesman, one or two observers called attention to the persistence of physical signs, after pneumonia, in syphilitics, and raised the question as to whether such chronic bronchopneumonias might not often be syphilitic in origin.—Ed.)

THE ETIOLOGY AND LABORATORY DIAGNOSIS OF ACTINOMYCOSIS: *Sanford and Magath*, (Mayo Clinic), Minn. Med., February, 1922, p. 71.

The actinomycetaceae are represented in the classification of the Association of American Bacteriologists by two genera, (1) *Actinomyces*, which include the anaerobic pathogenic types and; (2) the *Nocardia*, which include the aerobic species, primarily saprophytic. In the 96 cases in the Mayo Clinic, reported in this article, 84 occurred in males; of occupations, 57 occurred in farmers. With regard to location, sixty-one occurred about the face and neck, and of peculiar interest; the next most frequent location was in the appendix (14 cases). In the appendix and intestinal tract, the disease is usually more chronic than when found about the face and neck. Their series include only two cases of lung infection, while the 119 cases from literature reviewed by them, there were 16 cases of lung infection. The authors believe that many of these latter were probably nocardiosis, which is relatively more frequent in the lungs than is actinomycosis.

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THE MANAGEMENT OF SOME CHRONIC DIGESTIVE TROUBLES*

DR. D. E. SMALLHORST, El Paso, Texas.

The embryonic alimentary tract, at about the 28th day, is nothing more than a straight tube, bulging slightly posteriorly at a point about one-third of its length from head end of the embryo, the bulge representing the stomach; this canal is attached to the posterior body wall for its whole length. The vagi nerves lie upon each side of the esophagus and stomach. About the third month the stomach begins its rotation upon its two axes, so that what was the left side now becomes the anterior surface, and the right side the posterior surface. The top or cardiac end drops down and to the left, while the lower or pyloric end is drawn up and to the right, so that about the end of the third month, the fetal stomach has assumed its normal shape and position. The intestinal canal begins to show flexures about the sixth week, when the duodenum is well marked as that portion of the gut tube that passes from the lower end of the stomach towards the dorsal body wall; from this time on, the growth and development of the small intestine consists chiefly in an increase in length, with consequent modifications of its mesentery. The striking feature is the rapid growth in length of this gut, and the fact that it extends from the abdominal cavity into the umbilical cord. This extrusion keeps up until about the end of the tenth week, after which it is gradually

withdrawn into the abdomen. At the end of the fourth month it lies entirely within the abdominal cavity. A failure of the complete restoration of this gut to the abdominal cavity results in a congenital umbilical hernia.

The vitelline duct connects the early gut tube with the umbilical vesicle. At about the sixth week the umbilical vesicle begins to retrograde; this leaves the vitelline duct connected to the ventral surface of the gut tube; this duct suffers complete obliteration, in most cases, in the later stages of fetal life. In some instances, however, its proximal or gut end does not retrograde, but presents a blind pouch of varying length, which is known, after birth, as Meckel's diverticulum. Should this tube remain attached to the umbilicus after birth it results in a congenital fecal fistula.

In the third month the vermiform appendix is only a curved slender tube projecting from the cecum. At its first appearance it is the same size as the cecum, but, in the rapid growth of the gut, the appendix lags behind, and later appears in adult life as a very small tube of varying length attached to the end of the cecum.

About the sixth week the lower bowel undergoes quite a change by lengthening, and the consequent change in position; there is presented the cecum,

*Read before the Thirty-Ninth Annual Meeting of the New Mexico Medical Society at Albuquerque, April 29th and 30th, 1921.

transverse colon, descending colon and rectum, with ascending colon absent until about the end of the third month, when the cecum gradually extends down, and, by the end of the eighth month, the entire intestinal canal is complete and in its normal adult position.

The anatomy of the alimentary canal, briefly, is as follows: The esophagus is only a passageway for food and other substances from the mouth into the stomach. It retains almost indently its embryonic position. The stomach is the pouch-like enlargement of this canal, and is held in position by attachments formed from omentum and from its rotation into position together with the migration of the liver to its position in the right upper quadrant, carrying with it the peritoneum as a complete envelop. This peritoneum unites at the transverse fissure of the liver and extends down as the lesser omentum and is attached to the duodenum and lesser curvature of the stomach. The esophageal end is fixed more firmly by a fold of peritoneum, the result of the rotations of the stomach, and the migration of the kidneys to their adult positions. This attachment is the gastrophrenic ligament.

The intestines are held in position, or rather attached to the posterior body wall, by the mesentery which is an extrusion of the peritoneum, coming from the body wall and completely covering the intestines with the exception of a small triangular space upon the superior surface, where the two peritoneal coverings come together. Similar triangular spaces are formed, in same manner, on the greater and lesser curvatures of stomach. These spaces carry the blood vessels and nerves that supply the stomach and intestines.

This brings us to the purpose for which this canal is used in the life cycle. To maintain animal life, the constant building up and replacing of used or waste tissue is accomplished by a process through which all substances pass when introduced into this canal. These ingested substances or foods must have certain physical and chemical properties in order to meet the body

requirements. These properties are given the foods by the process of digestion.

The general physiology of the change is carried on by the whole system complex which makes up a most important part of the human body known as the Digestive System. The function of this system is to bring the food into such a condition that it can be absorbed through the intestinal epithelium into the blood and lymph. The carbohydrates are broken down into monosaccharids; neutral fats are split into fatty acids and glycerin; proteins are broken down into amino acids. The agencies which effect these decompositions are the digestive enzymes and ferments contained in the various digestive fluids and juices. The digestive juices are produced by glands, which are most numerous in the upper levels of the digestive tract. The lower levels have, as their function, that of absorption of the digested foods. In order that the food may be kept in a state of proper consistency, and may move readily along the digestive canal, numerous mucous glands are scattered throughout the whole extent of the canal. Some of the main salivary glands, as well as the pancreas and liver, discharge their secretions into the digestive canal by special ducts; others, like the isolated salivary follicles of the mouth, the gastric glands, and the crypts of Lieberkuhn in the intestine, do not have anatomically distinct ducts, but discharge their secretions directly into the digestive tube.

Another form of digestion that takes place in the small intestine is "Bacterial Digestion." This has been found to be as important to life and metabolism as the enzymic processes. Chicks hatched under perfectly sterile conditions and fed sterile food die in a very few days after birth, but when fed the same food mixed with a portion of their excrement, they live and thrive. Living bacteria are more numerous high in small intestine, and decrease on down through the canal, so that the estimation is probably not an exaggeration, when it is stated that very nearly one-fourth by weight of the dried human feces, is made up of the bodies of dead bacteria.

The nitrogen content of feces amounts to about 1.5 grams per day, about one-half of which is bacterial nitrogen. The diet of course not only controls the amount of feces, but also the number of bacteria. A diet rich in cellulose, such as green vegetables, fruit, etc., not only increases the mass of feces but also the number of bacteria.

For the digestive process to proceed normally, there must be no anatomical or pathological derangement of the canal or its contents. Should there be a disturbance of digestion there must necessarily be some anatomical malformation or pathological condition directly or indirectly connected with this canal to cause the disturbance. It is intended to show some of the causes of these derangements, and to mention the resulting digestive disturbances, with what has been of service to me in the management of such cases.

Most of the cases to be described can be grouped into one of two classes, either Gastropptosis or Enteropptosis because of the displacement or dropping down of some portion of the digestive tract. In the cases where the stomach is ptosed to the third degree there is decided pull upon all the tissues and organs to which the stomach is attached. This constant drag or pull of the loaded stomach, in many cases, causes a kink in the early portion of the small intestine resulting in irritation with perhaps adhesions that, in themselves, may be the cause of severe pain and other distressing symptoms, such as ulcer, dilatation, hypo or hyper acidities, partial stasis, or atony of the stomach. The ptosed stomach always carries the colon down with it; this may cause kinks or folds in the colon and the pressure of the loaded stomach upon the colon may not only cut off the free progress of the food through the colon, but frequently the colon is irritated by this pressure to such an extent that any degree of colitis may result, with all the distressing symptoms of that disease.

The etiology of gastropptosis is very difficult to determine; many contributing causes may enter and all must be given consideration. This trouble occurs more often in women than in men;

it is caused by improper or ill-fitting clothing, movable or dislocated kidney, liver, or intestine; diverticulitis; repeated pregnancies; traumatism; meteorism; tumors in the abdomen; disease or malignancies at or near the pylorus; abdominal adhesions; volvulus; intussusception; Lane's kink; anemia; weakened tonus of attachments; overloading of stomach; recurring attacks of appendicitis, etc.

As to the etiology of ptosis of the intestines, what is said of the stomach can be said of the intestines, adding also, intestinal parasites; ingested foreign bodies, such as hair, nails, pins, glass, seeds, etc.; also gastropptosis; adhesions; loss of tone of abdominal wall.

The symptoms are as varied as the individual sufferer. The patient usually complains of pain of a varying degree of intensity, immediately after or perhaps some hours after eating, at the epigastrium or at the normal duodenal position; they also complain of much gas, and a fullness in the gastric region with eructations of a tasteless gas, fluid or even ingested food; the taste may be sour to bitter, according to the time elapsed after eating; there is often a feeling of weight or a lump in the stomach; headache, backache, burning spots over the surface of the body especially the back; certain foods bring on a digestive discomfort, usually greasy food, pork, raw fruit or salads, highly seasoned food, rich pastries, etc. Most of these patients suffer from constipation; at times, however, this may alternate with diarrhea.

If there is a displacement of both stomach and colon there is a most obstinate constipation with a general abdominal tenderness and bloating, with headache, dizziness, spots before the eyes, coated tongue and a tendency to hemorrhoids.

The laboratory is a great aid through the knowledge furnished of the gastric secretion and motility. The x-ray checks up the motility and gives us position, abnormality in outline, and the presence of many pathological conditions in or near the stomach and intestines; it also shows the movement of the contents in the different segments of the canal. By bringing together all these aids one is

able to arrive at a fairly accurate diagnosis.

TREATMENT

Some conditions, such as tumors, recurring appendicitis, foreign bodies, etc., must be corrected at once, and surgery, up to the present time, is the best remedy. However, other conditions are many times completely relieved by one or more of the following means of treatment: Restore the displaced organs as near to their normal position as possible. This is done by an abdominal support. The adhesive belt is applied and worn for four or six weeks; if this gives relief then some commercial support or corset, whichever is best suited to the individual case is fitted. Rubber supports are as a rule very unsatisfactory, short lived, and give pressure at the wrong place. This pressure should be of a lifting character, from below up. To accomplish this, at times a crescent-shaped pad is placed under the support and proves very satisfactory, especially if the patient is thin or emaciated. It is advisable never to have pressure applied to the abdomen above the umbilicus. In massage of the abdomen, there are four movements that have proved very useful, especially if constipation is an accompanying symptom. They are, briefly, as follows: Before arising in the morning drink at least two glasses of water; then lying prone, with knees flexed about 45°, with the heel of the hand rub down toward the pelvis, bringing hands up from pelvis to ribs with fingers pressing firmly into abdomen, as though kneading bread. The second motion is pushing alternately each side towards center of abdomen. The third is a punching motion, in which the tips of the fingers are pressed firmly and deeply into all parts of the abdomen. The fourth is made by placing the fingers of one hand upon the other and beginning at the right lower quadrant, with a deep corkscrew motion and following the colon, the contents of this gut are pushed into the sigmoid.

Immediately after this massage the patient goes through a bending exercise. We advise the modified army

"setting up" exercise. Any method will do that will bring all the abdominal and back muscles into use. Both of these sets of exercises should never exceed twenty minutes, with the caution that overexercising at first defeats the purpose, but that constant attention to details will, in the end, produce the most gratifying results.

Diet is also very important and should receive the most careful study and attention. Outline a diet that will not give discomfort but will be both agreeable to the taste as well as pleasing to the eye. Distasteful or poorly served food very seldom satisfies or builds up tissue. These patients have all lost weight and, to regain this, too much care and attention cannot be given to what food is put into the stomach, and how it is served.

Medical treatment comes in for due consideration, but should never be used to the exclusion of everything else. In correcting the digestive juices artificially, about all is done that should be done. Very frequently these secretions return to normal very quickly if the above procedures have been religiously and intelligently carried out, and to give medicine when not needed is not only needless but hinders the complete recovery of the patient.

The displacements of the intestine are treated in the same manner as gastroptosis. If, however, there is a colitis or an intestinal stasis, there might be added to some of the above treatments a colonic flush. This is given by using from two to five gallons of water with one teaspoonful of soda to each quart of warm water, injecting slowly, with the douch can not over two feet above the buttock. This flushing should be given at least once and not oftener than three times each week, according to the severity of the case; on each alternate night about three to eight ounces of some vegetable oil is introduced into the colon and retained all night.

Sinusoidal electricity is another valuable aid in these conditions; not only in the psychological effect upon the patient, but in the stimulating and toning up that electricity has upon flabby muscles, it is, at times, very pleasing, and

good results are obtained much quicker with electricity than without it.

CONCLUSION: Take plenty of time in summing up conclusions before arriving at a diagnosis. Do not neglect the complete history, the routine physical examination, as well as the laboratory and x-ray, because each is valuable. Do not get discouraged if no immediate improvement is shown; months elapse, at times, before there is a decided change for the better. Never consent to surgery for these conditions until all possible medical and mechanical measures have been tried intelligently without improvement, for many times the surgical results are as bad, if not worse, than the original trouble.

DISCUSSION

DR. PRENTISS: I enjoyed this paper very much indeed. There are a few details I think of that may be of interest and importance. One of them is, of course, habit. Poor habits can frequently be connected up with poor health. In many cases the conditions in which the patients come are the result of factors operating for years, sometimes started as very slight errors, and generally, with more and more neglect, they become of increasing importance.

One habit is failure to go to the toilet when the patient should. This frequently begins in childhood. After a while this leads to toxemia, sometimes incorrectly called auto-intoxication, and that, in turn, can lead to chronic colitis, which, by producing contraction, will make the constipation worse, and following that, adhesions and ulcers of the stomach, infections, etc.

Another thing you frequently bring out as a habit is the failure of people to drink sufficient water. That is true not only with women,—I think it is fairly the rule with ladies,—but it is also astonishingly frequent with men, and when you get these clinical pictures and get a record of that, it is not indicated only to bring the amount of urine up to the normal amount, three pints, but try to bring the total quantity up to four pints. That helps in the elimination of toxin.

Also, get them to cut down the salt. Very frequently people will eat too much salt and pepper, particularly down south, and when you cut that down, frequently the hyperacidity of the stomach will diminish, and the nervousness, too.

Books on dietetics state that people who eat too much sodium chloride get nervous symptoms when otherwise they would not,—nervousness in women and in men, neurasthenia. Also, the excretion is diminished. I mean the excretion of the salts in the urine, particularly by the volatile oils contained in

the condiments. When you use too many of these things the food is absorbed, goes through the liver first and then the kidneys and then excreted. When there is much auto-intoxication there is usually a subnormal toxin in the liver and that is an indication to cut down on the pepper and salt and such articles of food.

The x-ray examination gives valuable points with regard to motility. Now we can have the x-ray made and if there is a residue, it shows that the smaller intestine, and ordinarily where there is retention, it is very solid in the small intestine. It is usually in the colon, and then the material can be readily relieved by irrigation. Three pints of water very readily gets rid of everything in the colon.

DR. FRISBIE: The effect of posture as a cause of this condition I want to speak of, in which the duodenum is pushed upward, the back rounded and the shoulders stooped,—this is a very bad posture and certain to predispose to this condition and is a very large element in it.

If we can get at the girls and boys in the schools,—which I am trying to do with the university girls here, with the various gyms and the physical culture,—they should realize the influence on their physical health of these things, good, active, out-of-door work or recreation would build up the entire condition and do more towards eliminating this condition than anything else.

DR. HANNETT: I feel that this is likely a congenital condition more often than anything else and if we do try to remedy this in a preventive way, we must begin early. These potbellied children are in a condition of ptosis of the stomach and liver. During the past year I have had two cases to operate on, two children. Both cases had a long attachment of the bowel; the ileum was telescoped into the cecum, both above and below. Both had a long attachment of the bowel where it is fastened in the back, which predisposes to stasis and intussusception. If we began early we could do some good. With a knee and chest position, by putting a large amount of fluid into the bowel, we could shorten the attachment and empty the colon. The colon and stomach seem to be the ones most affected with ptosis.

DR. LYNCH: In certain of the pictures, one in which the ascending colon was sort of adherent, I think would have to be explained on some other basis than that of congenital deficiency. I see a large number of pyelitis cases in which the infection takes place through the intestinal tract. In doing a certain amount of surgery I occasionally saw a case of pan nural celitis. Just what these were due to originally was pretty hard to determine, possibly in some cases constipation and in others dysentery. They did have pan nural celitis, and ptosis was really a result of an antecedent inflammation not due to posture or anything else mentioned.

I agree with Dr. Smallhorst, that the so-called case of ptosis should not be subjected to surgery. I think the general surgeons have gone through that period. However, there are

getting to be a certain number of these cases which are of the adherent type, which will eventually come to surgery, and those cases especially in which you have to do with the ascending colon and possibly the first half of the transverse colon.

DR. SMALLHORST: I wanted to bring out the fact that ptosis was the result of some other inflammatory process,—appendix, gall-bladder, etc. I do not think that posture has anything to do in it. Of all children I have x-rayed none have had ptosis of stomach or intestines. I may be wrong, and would like to be corrected, if so. Ptoses are usually the result of some inflammatory process that has been caused by overloading and a dragging down of some portion of the digestive tract, the attachment of which would, by pressure or the resultant kinking, prevent the free passage of the contents on through the gut. Severe cases of ptosis should be put to bed with the foot of the bed raised about six

inches. If you can lift those organs three or more inches and hold them there by a support or belt, your patient is going to be comfortable and other symptoms will be relieved. The average belt sold by the drug store is absolutely useless; it must be intelligently and properly fitted. In the case of the cowboy shown, a leather belt about seven inches wide, dropped down and fitted well over the hips was put on him, and he has not had one bit of trouble since. In the case that had adhesions, she became pregnant, went to full term, has worn a good fitting support since, and has had no trouble.

My advice is to use the belt and keep the colon empty. I recommend the colonic flush. I have two patients at present who are using 5 to 20 gallons of water about every ten days. The amount of water to be used is judged by the coloring in the return flow; keep flushing until the water returns uncolored, if it takes one or twenty gallons.

ORGANOTHERAPY*

DR. M. B. CULPEPPER, *Carlsbad, N. M.*

Our profession has always searched for greater efficiency and, when a new remedy is suggested, we, at once, begin to try its virtues in whatever way our environments admit, for I know of no profession more willing or eager to find better methods. Many remedies come and go and leave us no legacy by which to remember them. I am glad to say that we have, in the last few years, been the recipient of a number of excellent new remedies and among this new list probably more have sprung from Organotherapy than from any other one source. More remedies of specific action and real merit,—and it is my opinion that many more remedies of merit will soon evolve from this same source and those of us who fail to grasp the situation and make a study along this line will suffer for our negligence. It does not take many fingers and toes on which to count the number of specifics in our old pharmacopea and we often wonder why so much was written and so much space taken in the description of so many useless and non-specific remedies. How often have we read in our text-books of the thera-

peutic value of some remedy and prescribed it, hoping that we had struck the key-note and that our patient would be freed from his ailments, only to be again disappointed. Time after time we have been disgusted and almost felt as if our profession was a failure. But for the few real meritorious medicines, no doubt many, if not all, of us would have long ago left the field of action for a more reliable profession.

In organotherapy we have a few remedies which we are proud of and they are of comparatively recent introduction. Take Thyroid Extract, follow its action in a case of Cretenism or Myxedema. If given carefully and with proper general management, we are able to cure a very large per cent of these cases. I would like to ask you what you are to expect from any of our old line of drugs.

Adrenalin is specific in its action as a hemostat under circumstances where it is applicable, and I would ask you to point out its equal or anything that will begin to approach this wonderful substance along its line. It also has many other good qualities.

*Read before the Eddy County Medical Society at Artesia, N. M., April 25, 1921.

Pituitrin probably has won more general commendation as a uterine stimulant in parturition than any new remedy in recent years.

Corpora Lutea is fast becoming the standard remedy in vomiting in pregnancy; can be administered in capsules or hypodermically.

These wonderful organotherapeutic remedies, taken singly or in combinations have set the stage for real organotherapy, and when we more thoroughly understand Endocrinology and hormonal action, their relations with one another, and their effect upon metabolism, we can work out the formulas that will, in my judgment, approach true scientific medication.

In order to appreciate more fully the possibilities in these remedies, we will have to study the actions of the endocrine glands and I will endeavor to point out a few of those which are best understood.

The Thyroid Gland has, as its principal secretion, Thyroidine which enters directly into the lymphatic system and blood current. It affects metabolism by decreasing body waste, by a more perfect oxidation of fats and of elimination; it also increases bone development and stabilizes the nerve centers. Without a sufficiency of this substance we have cretenism in the young and Myxedema in the old.

The Adrenal; as yet the character of its secretion is not understood chemically—but its physiologic action is more nearly made out, and is known to affect the blood pressure through its action on the inhibitory nerves of the sympathetic system. It also probably has more to do with our emotions—as laughter, excitement and depression, than any other one of the endocrines. Remember that it affects blood pressure.

The Pituitary body consists of an anterior and posterior lobe, which have entirely different functions. In man

the anterior lobe is most highly developed and in woman the posterior lobe. Aside from affecting body growth, which may be hyper or hypo, according as the gland is developed, there is a distinct relation between this gland and the organs of generation.

It is now known that these glands do, through their secretions, produce what is called an hormonal action of all the other endocrine glands and when one of these is hyper or hypo active, the rest of them are affected accordingly and they, in turn, counteract the error of the affected endocrine in so far as possible. When the correction cannot be made, then our patient must suffer until we are able to help correct the endocrinic defect. Here is where our new remedies will be found; we must learn to detect which endocrine gland is at fault and also learn what other endocrine gland either inhibits or stimulates the affected gland. The endocrine glands taken from the healthy animal, dessicated and powdered, can be administered in capsules or tablets to supply the deficiencies in our patient.

These principles are put up in extracts and solutions and are combined in various proportions so as to meet the demands of our faulty endocrine and, by this procedure, we establish a normal hormone and our patient is relieved. Thyroid extract does this for Cretenism or Myxedema. Trypsogen does this for high blood pressure, when it is due to hyperadrenia; corpora lutea does this in vomiting of pregnancy; nephritin acts well in Brights disease; secretin acts well in intestinal indigestion, etc. The various combinations of these principles will, in my opinion, when we learn to diagnose our case and to find the combination, relieve us of a great many difficult problems that we have heretofore been absolutely helpless to solve and I think it will also relieve the surgeon of a good many patients.

DIAGNOSIS AND TREATMENT OF HAY FEVER*

ROY CARL YOUNG, M. D.

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Hay fever is an anaphylactic phenomenon caused by the ingestion into the system of a proteose or albuminoid from plant pollen, animal emanation, food, or bacteria. This phenomenon is characterized by a swelling of the nasal mucous membrane with throwing out of a serous exudate, itching and burning of the nasal mucous membrane, pharyngeal mucous membrane and of the conjunctiva. The lacrymal gland is very much activated and there is an almost continual flow of lacrymal secretion. It is a constitutional condition which manifests itself by the reactions described above.

A patient coming to a physician for hay fever usually makes the diagnosis beforehand and comes in for treatment. Successful treatment will depend on the doctor making a correct differential diagnosis of the different causative agents, finding the causative pollen, animal emanation, bacteria, or food, and treating accordingly.

The technique for the skin test is as follows: The forearm is bared to the elbow, cleaned thoroughly with soap and water, and the skin sterilized with 95% alcohol. The alcohol is allowed to dry. Then with a small scalpel or scarifier a scratch from one-sixteenth to one-eighth inch long is made. This scratch should not go through the epidermis but just deep enough to open the epidermal lymphatics. If blood appears, this scratch should not be used as it will prevent the absorption of the extract. Usually six or seven such scratches are made according to the number of pollens to be used in the test. After the scratches are made drops of the test solutions are placed accordingly. A test, if positive, will show up in from five to thirty minutes. A positive reaction is characterized by an areola of redness varying from one-half to two inches in width with a small urticarial weal around the scratch

which varies in size from 0.3 c. m. to 2.5 c. m. There is also an itching or burning sensation around the positive test. A control test should always be made, using a drop of the normal saline solution. Some advocate the use of the opthalmic or intradermal test but I have never used either. Schloss states of the intradermal test "that when an alkali is used intradermally the results secured are of doubtful dependability." Walker, speaking against the intradermal, states: "It is much too delicate and even erratic."

In treating cases of hay fever, we are treating patients who are abnormally sensitive to a certain protein, whether it be from bacteria, foodstuff, animal emanation or pollen, and therefore, only one logical process is left to be followed; that is, the desensitizing of the patient. In the case of the pollens we have our specific pollen extracts which, when given in graduated doses at intervals of five days, will produce results. In the cases of perennial hay fever, that is, those due to animal emanations, we also have extracts of these proteins. I have seen one case of this kind which yielded to treatment. In the case of the bacterial type, a vaccine made from cultures of the nose and throat will usually give good results. In the cases due to foods, these must be kept out of the diet.

The treatment should be prophylactic as near as possible. Advocating a city ordinance which has for its purpose the destruction of all weeds. Avoiding all substances which the patients are susceptible to, such as food, plant or animal, etc. Specific treatment should always be preseasonal. By that I mean if a patient had hay fever last summer they should be tested out and desensitized by small doses of pollen extracts at least two months before the offending pollen appears. To quote Walker in the Boston number of the North

*Read before the Thirty-ninth Annual Meeting of the New Mexico Medical Society at Albuquerque, April 29th and 30th, 1921.

American Clinics: "Of 439 patients treated preseasonally with ragweed, 25% were entirely free from symptoms; 20% were practically free; 32% were 75% improved; 18% were 50% improved, and 4½% were not improved."

None of my twenty-five cases, except one, were given preseasonal treatment; in fact, they all came in with all symptoms present and usually very marked.

The treatment should never be attempted with extracts of three or four pollens in the same solution. In the first place, one cannot accurately gauge the correct dosage and desensitization to one group will not afford protection against another group. For instance, why give a patient who is susceptible to ragweed a mixture of ragweed, corn and goldenrod? Scheppegegrell, Goodale, Walker, Oppenheimer and Gottlieb, Hall and Selfridge all condemn the method of using the combined extracts. Scheppegegrell states that the principal reason for such a combination being used is to avoid the necessity of making a diagnostic test.

The pollen extracts that I have been using are from the Arlington Chemical Company and are put up in 3 c. c. vials in strengths of 1:10,000, 1:5000, 1:1000 and 1:100.

The patients are given an initial dose of one min. of the 1:10,000 solution of the pollen extract which they reacted to and a dose every five days. The dose was usually increased from one m. to three m., according to the severity of the symptoms and going from one dilution to another. In one patient a reaction of general malaise and dizziness was noted after receiving her treatment. On questioning her rather closely I found out that she had driven down the valley where there was plenty of sunflowers and she had received another dose by inhalation. That is the only case in which I noticed any reaction. These treatments were kept up until all symptoms subsided.

In my series of twenty-five cases treated during the hay fever season of 1921, fourteen cases were given relief by taking the injections; six cases were

slightly improved and five did not show any improvement.

On testing these patients I used test solutions of the following: ragweed, goldenrod, sunflower, corn, cottonwood, rose, timothy and horse hair. I was unable to get pollens of sagebrush, mesquite, greasewood or the tumbling weed, but will have them next year. It was interesting to note that one case that was tested out reacted to corn and after concluding the treatment routine she still had symptoms. I again tested her and found that she gave no reaction at all to corn, showing that she was desensitized and that there was another causative agent.

Four of the cases were complicated by asthma, and three obtained complete relief from both the asthma and hay fever.

Wilson, (J. A. M. A. Jan. 17, 1912) advocates the use of calcium chloride in doses of not less than three grains daily and noticed that the hay fever nearly completely disappeared. Hallopeter (W. C.), in a monograph printed in 1916, states that from Wilson's article and from the report of Emmerich and Lowe on the use of calcium in hay fever that these papers furnished us with the only positive internal remedy and is worthy of further trial. Dr. Stark tells me that he has used calcium chloride in 30-grain doses with marked relief in some cases. I used calcium chloride in three cases that came to me near the end of the hay fever season and I gave them from one to three c. c. of a 5% sol. calcium chloride *intravenously* with remarkable results. The three cases were having marked symptoms when they entered the office and before I finished injecting the solution they each remarked that their nose was clear and felt dry. This solution should be injected very slowly. The calcium chloride *intravenously* is certainly entitled to further trial.

CONCLUSIONS

1. Hay fever is an anaphylaxis.
2. Causative agents are proteins from bacteria, pollens, animal emanations, and food.

3. Correct diagnosis can only be made by the skin test or some modification.

4. Where there is correct diagnosis, desensitization can be accomplished in the majority of cases.

5. Specific extracts and not mixtures should be used in the treatment.

6. Better results will be obtained when we have a more complete list of pollens found in this region, especially greasewood, mesquite, tumbleweed, sagebrush, and bermuda.

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THE TREATMENT OF HAY FEVER WITH ARIZONA POLLENS*

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The causative relation of the pollen of certain plants to the pollen diseases, seasonal hay fever and asthma, has been a matter of popular knowledge for a long time. Blackley¹, in 1873, published proof of this belief, with an excellent description of the skin test now generally employed; in his title he used the then common names: "Hay Fever or Hay Asthma." Treatment by means of pollen extracts was first attempted in 1905 and has been in common use since 1913. In the eastern part of the United States it is widely and successfully employed, and an extensive literature has grown up about it. Since this literature applies only in principle to the disease as it occurs in the Southwest the customary superficial review of it is omitted; reference will be made to such items as bear on the matter in hand. The purpose of this paper is to record observations on pollen disease as it occurs in Arizona, with the results of treatment of a few patients with local pollens.

The hay fever situation in the Southwest is peculiar, in that the local flora differs from that found elsewhere, the climate is subtropical with a pollinating season of about nine months, and large areas under irrigation are not intensively cultivated, so that weeds grow profusely. The lack of rainfall allows pollen to stay a long time in the air, and still longer in the dust. For these reasons the number of pollen sufferers is large; those sensitive to one pollen at the outset acquire multiple sensitization in time; pollen asthmatics from the East become affected by local plants after a breathing spell of two or three years; and, as population and irrigation increase, so does the amount of pollen in the air and the number of those made ill by it. Those with multiple sensitization have continual trouble for nine months, and some, as will be shown, have practically no free period.

The treatment of this condition has been rather unsatisfactory. Alkaline

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phosphates helped a few, mostly asthmatics; a certain number were helped, often temporarily, by intranasal surgery or topical applications, some others were benefited by bacterial vaccines or by solutions of pollens from plants not found in the Southwest. In connection with this latter group should be considered the results obtained by Sterling² with non-specific protein therapy. In the main the patients fell back on adrenalin ointment and the like; not a few were forced to leave the region half the year or altogether.

Experience elsewhere has fully demonstrated that the response to pollens and pollen therapy is highly specific. The identity of the plants locally important in this connection remained in doubt. Selfridge³, working with Professor Hale, worked out the problem for the west coastal strip, Hall⁴ made a contribution for California, and Key⁵ for Texas. Scheppegegrell⁶, using all available sources, published a list of hay fever plants that failed to include the most important for Arizona. Recently, Watson and Kibler⁷, working with Professor Thornber of the University of Arizona, made public the result of their three years' research. They attacked the problem in the only logical way, by collecting the pollens of many plants from all over the Southwest, and testing a large number of hay fever patients. They definitely identified the species etiologically important, and established on a sound basis the study of pollen disease as it occurs in this region.

In 1920 the writer, being unaware of Watson's work, began to test with solutions of all the commercially obtainable pollens all the hay fever and asthma patients within reach. The results were mainly negative; a few gave more or less positive skin tests with sunflower and alfalfa extracts, and some others, Easterners usually, reacted to ragweed. Treatment with commercial pollen extracts was attempted in a few instances, with no resultant benefit; one patient, treated with alfalfa pollen, became worse. In 1921, the task of collecting the Arizona

pollens was taken up in earnest; some 22 pollens were collected from an area extending from Phoenix to Ash Fork, and quite a number of hay fever patients tested. Most of these were held over for preseasonal treatment, which 22 have already begun. A few were treated during the season, with fair results.

A word here as to protein sensitization, or allergy. Cooke⁸ defines it as a natural hypersensitiveness to certain specific substances, usually proteins, occurring in individuals not as the result of immunologic processes. Its manifestations resemble those of anaphylaxis, but are much more intense. The capacity to develop sensitization was found by Cooke and Vander Veer⁹ to be hereditary, being transmitted as a dominant trait. They find such capacity to be present in about ten per cent of all persons. When a sufficiently strong solution of the specific substance to which he is sensitized is brought in contact with an epithelial surface of an allergic individual, a characteristic reaction ensues, depending on the tissue; if it be placed on the abraded skin, an urticarial wheal; in the conjunctiva, redness and edema; on the nasal mucosa, hay fever; in the trachea, an attack of asthma. If the substance is ingested, a sharp gastro-intestinal upset takes place; and if it is absorbed unchanged or is parenterally introduced, depending on the quantity of the substance and the degree of sensitization there occur hay fever, asthma, urticaria, angioneurotic edema and sometimes collapse. Small and repeated doses partially desensitize the patient. Cooke⁸ and Coca have shown that occasionally these reactions may depend on some group of the molecule that may be contained in chemically allied substances, although usually sensitization is to the entire molecule. For all practical purposes, however, the sensitization may be regarded as specific. The principles outlined above, applied to pollen disease, explain its symptoms, furnish the method of its diagnosis and provide the basis of its treatment. The diagnostic test is performed by placing upon a minute cut in the skin a small

amount of the suspected pollen,* moistened with N/20 NaOH, or a strong solution of pollen protein. A positive reaction appears within 30 minutes, in the form of a distinct urticarial wheal with raised irregular margin, at least 0.5 c. m. across. If the reaction is strong, as it usually will be if the pollen is causing hay fever, the margin of the wheal extends in pseudopod-like projections to a diameter of 1 c. m. or more; a finely mottled vivid erythema surrounds the wheal, and the area itches intensely.

Given uniformity of technic and of test solutions, the size of the wheal indicates the degree of sensitization to a particular pollen. A more accurate measurement is made by testing with serial dilutions. Of two or more pollens known to occur co-seasonally, the one should be used in treatment that reacts in the highest dilution, and treatment is begun with the serial dilution next higher than the last that gave a positive test.

The intradermal test is used by Cooke¹⁰, Rackemann¹¹, Scheppegegrell¹², and others. In my hands it has proved unsatisfactory because of the exquisite sensitization occasionally found in local patients with their prolonged pollen exposure. The technique of test and treatment detailed by Walker¹³ in his numerous publications has been found very serviceable.

Because of not yet having all the important pollens, tests done earlier in the season are valueless for statistical purposes and are not reported. In the cases tabulated below, uniform technic and the full set of standardized pollen solutions were used. Similar solutions of unimportant pollens were used as controls, and if the history indicated it tests were made with eastern pollens and with epidermal and bacterial proteins. Only 10 of the pollens used figure in the table; the other 12 experimented with were found to be unimportant except as noted.

*Patients, in their first or second season, are preferably to be tested with whole pollens, as the skin is not yet fully sensitized.

Table I shows the findings in 35 pollen-sensitive patients, with the number of years since symptoms first began, and the hay fever season at the beginning and at present.

Table II shows the approximate pollinating seasons of the different plants implicated. The two will be discussed together.

There are at least three hay fever seasons in central Arizona; in some places they are separated, but in the irrigated country they overlap. The first is caused by the shade trees, mainly the cottonwood (*populus Macdougalii*), and the Arizona ash (*fraxinus attenuata*). In the region under discussion (and all dates hereafter given apply to this region) they begin to pollinate early in February and their pollen is in the air until about April first.

The second season, covering April and May, is dominated by Bermuda grass (*cynodon dactylon*). This grass, introduced as a lawn grass, is spreading widely and is a formidable competitor of the native grasses. It blooms more or less all the year round, and patches with considerable pollen may be found at this writing (Jan. 15), but its first general florescence is in the spring. In June its pollen decreases until after the summer rains, when it comes on afresh. Johnson grass (*Sorghum halepense*) is a profuse bloomer from May till frost. It has a pollen almost as heavy as that of corn, but it sometimes gives severe symptoms to rural residents who are subject to massive exposure. Milo maize interreacts with it, affecting persons sensitive to Johnson grass.

The third season begins about July first or a little earlier, and continues till frost, not ending abruptly but gradually. It is due in part to the members of the amaranth and chenopodium families,—*amaranthus palmeri*, *a. retroflexus*, the common careless weed and pigweed; lamb's quarter, or goose foot, a name used for several species of chenopodium, and the three common sorts of atriplex or salt bush, locally and incorrectly called hop sage. These plants apparently interreact com-

TREATMENT OF HAY FEVER BY ARIZONA POLLENS

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TABLE I

Patient No.	Duration of Symptom	Season at time of Onset	Season at Present	Cotton-wood	Ash	Bermuda Grass	Johnson Grass	Chenopodium	Salt-bush	Pig-weed	Bur Ragweed	Warn-wood	Sun-flower Group	Other Sensitizations
1	Yrs. 8	Sept.	All year			++	(See Case Report)							Wheat proteins streptococcus
22	4	Apr.-May	Apr.-Nov.			++								
23	6	Aug.-Oct.	Apr.-Nov.			+++				++				
24	3	Apr.-May	Apr.-Nov.			++++								
25	3	Apr.-June Sept.-Nov.	Same			++								
26	3	Apr.-Oct.	Same			+++								
27	10	Apr.-Oct.	All year			++								Feathers Streptococcus
28	0	April	First Season			+	+							
29	1	Apr.-May	Same			++								
30	2	Apr.-May Sept.-Oct.	Same			+++								
31	0	Aug.-Sept.	First Season									++		Chloris
32	3	Aug.-Oct.	Same			++								(Chloris)
33	5	Aug.-Oct.	Same							++	+	+		
34	5	Aug.-Oct.	Same							++				
35	12	May.-Nov.	Same				+++							Maize
36	14	Aug.-Oct.	Same								++	++	+	Streptococcus
37	15	Aug.	Feb.-Nov.		+++	++++	+++			+++				
38	22	July-Sept.	All year	++	+	++		+++	++	+++				
39	43	Aug.-Sept.	All year					+++	+	+++	++			Streptococcus Eastern Ragweed
40	16	June-Nov.	Same					+++	++	+++				
41	10	Apr.-May	All year	+	+	+++	+++			+++				
42	5	Apr.-May	Feb.-Oct.	++++	+	+++		++	++	+++				
43	4	Feb.-March	Feb.-Dec.	++++		++++				++++				
44	4	June-Sept.	Same					++	+++	++++				
45	4	Feb.-Nov.	Same	+++	+++	+++	++	++	+	++++				
46	5	Aug.-Sept.	Same				++					+++	+	
47	1	Aug.	Same				++++							
49	7	Apr.-May	All year		+++	++++				++++		+	++	
50	16	Feb.-March	Feb.-Nov.	+++	+++	++				++++	+++	++	+++	Rabbit bush
51	7	Feb.-March	Feb.-March June-Nov.	+++	+					+++				
52	10	Aug.	Feb.-Apr. Aug.-Nov.		+++	++++					++		++++	
53	4	June-July	Apr.-May			+++								Timothy
54	20	Apr.-May	Apr.-Oct.	+++				+	+	+++				
55	?	July-Oct.									+++	+++	++	
56	10	Aug.-Sept.	Apr.-Dec.	+			+				++			Rabbit bush

No Mark indicates no reaction, or a weak reaction, less than .5 cm. in diameter.

+ Means positive reaction, 0.5 cm. in diameter.

++ Means positive reaction, 1.0 cm. in diameter.

+++ Means positive reaction, 1.5 cm. in diameter.

++++ Means positive reaction, 2.0 cm. in greatest diameter, with spreading irregular margins.

TABLE II

POLLEN	February		March		April		May		June		July		August		September		October		November	
Ash		++	++	++	+							RAINS								
Cottonwood	++	++	++	++																
Bernuda				+	++	++	++	++	++	+	+	+	++	++	++	++	+	+	+	
Johnson							+		++	++	++	++	++	++	++	++	+	+		
Chenopod									++	++	++	+	++	++	++	+				
Saltbush									++	++	++	+	++	++	++	++	+			
Pigweed									++	++	++	+	++	++	++	++	++	+		
Bur Ragweed													+	++	++	++	++			
Wormwood													+	++	++	++	++			
Sunflower Group										+	+		+	++	++	++	++	++		
Chloris														+	++	++	++	++		

+ = Present but not Abundant.
++ = Abundant.
Records are for the first half and the second half of each month.

pletely as between different species of the same genus, and they show a certain tendency to interreact as a group. Only the strongest tests are shown in the table, but from the original records it appears that no one has reacted strongly to one without reacting more or less to the others. It has been thought advisable, therefore, to consider them as a biologic group but to test separately with the three members and to give treatment with the one causing the strongest reaction. After the summer rains all these plants pollinate profusely, and in the irrigated country the grasses, Bermuda and Johnson, which have decreased considerably in pollination during July, come on afresh. A new grass appears, *chloris elegans*. This grass interreacts with Bermuda and heightens its effect, so that late summer and fall hay fever is very severe in those with multiple sensitization.

In the middle and higher altitudes the chenopods and amaranths are found, but they are secondary in importance to the wind-pollinated compositae, chief of which are bur ragweed (*franseria*) and two or three species of wormwood (*artemisias*). Bermuda grass is absent and Johnson grass may be, but the *chloris*, the common name of which is supposed to be finger grass, plays an important part. Among the composites, as among the chenopods, there is a strong tendency to group reactions, and it extends to the common flowering compositae. These include sunflower, western goldenrod, and rayless goldenrod or rabbit bush*, asters, daisies, and many species cultivated as ornamental. Close exposure to these flowers brings on attacks in certain persons sensitized to the wind-pollinated compositae, and it is not at all inconceivable that in some cases the insect-pollinated plants may initiate the sensitization, as has been shown infrequently to be the case elsewhere.

Before leaving this phase of the subject, it should be recorded that the writer failed to obtain the spring pollens of the moderate and higher altitudes in working quantities and in this matter the report is incomplete.

Analysis of Table I shows that of 35 patients 19, or 54%, had most of their trouble from a single pollen, although 8 showed weaker reactions to other pollens, indicating that multiple sensitization was in process of development. Nine were due to Bermuda grass, 5 to the compositae, wormwood and bur ragweed, 2 to Johnson grass, 2 to the amaranth-chenopod group and 1 to *chloris elegans*. Six of these 19 patients had a season of six weeks, and the average season for the group is about three months. The average duration of their disease was four years. In other words, the early cases are first sensitized to one pollen.

The same was originally true of the 16 multiply sensitized patients; 15 of them had at first a short season, which usually had extended at both ends. Of this group 12 now have trouble from ash, cottonwood or both, and their dates of onset confirm the skin tests. Ten are sensitive to Bermuda grass, 2 strongly react to Johnson grass, while weaker reactions from this pollen are usual. Eight suffer from the amaranth-chenopod group, six from the compositae, and one from *chloris*. Four react to streptococcus, one to wheat proteins and one to goosefeathers. The average duration of hay fever in the multiply sensitized group was 10+ years, and excluding two complicated cases, the average hay fever season nine months.

The Bermuda-sensitized patients lived in the Salt River Valley; all those reacting only to the composites lived at moderate or high altitudes. The two reacting only to Johnson grass lived on ranches.

*The rayless golden rod (*chrysothamnus*), a plant which covers large tracts of uncultivated soil. It is about two feet high, has a rank odor, and in autumn bears clusters of inconspicuous yellow flowers which are followed later by the larger clusters (pappus) of feathery white seeds. According to the books, its common name is rabbit brush, as distinguished from the rabbit bush (*franseria deltoidea*) an entirely different plant mentioned by Watson and Kibler. Unfortunately, such of the laity as I have questioned do not make this distinction. The present state of Arizona botany is confusing. Texts vary considerably, and the names given as common ones frequently turn out to be locally unknown.)

It will be noted that the present article attempts to determine within a limited area the most important causes of hay fever. The findings coincide more nearly with those of Watson and Kibler than with those of Scheppegegrell.

A word as to the common belief that hay fever is caused by roses and by cottonwood floss. A very strong solution was made from cottonwood floss taken from the seed pods before they were ripe. With this and with rose pollen all the earlier patients were tested, always with negative results. The cotton flies and roses bloom at the height of the first Bermuda grass season.

In Table I it is stated that 6 patients have hay-fever symptoms all the year round. This is intended literally, though it should be understood that their worst symptoms occur in the pollen season. Special study was given this group. Patients 1, 27 and 39 were found to have genuine hay fever with other sensitizations added, and by appropriate treatment all were relieved during the winter months. Patients 38, 41 and 49 react to nothing but pollens. All have Bermuda grass as their chief cause of trouble and since beginning preseasonal treatment two have been entirely relieved, for the first time in years while in their usual abodes. It seems fair to conclude that their mild winter symptoms were due to small amounts of Bermuda grass pollen.

Sixteen of the 35 patients have a positive family history of hay fever or asthma, sixteen a negative one, and three do not know. Five have had nasal operations, with temporary relief in four instances. Thirteen took either Eastern or California pollen antigens the preceding year. One obtained 90% relief, one 50%, three others 25%, and eight were not benefited.

Intraseasonal treatment was attempted in 15 cases, and preseasonal treatment once.

Patient 1 had symptoms the year round, but was much worse in September. Tests had shown her to be sensitized to wheat proteins and streptococ-

cus. Wheat was eliminated from her diet and an autogenous streptococcus vaccine given. She was almost entirely relieved until last April she came to Phoenix, where she had hay fever, and tests showed a strong reaction to Bermuda grass. She was given a course of Bermuda grass 1:5000, as she was very sensitive to it, and was free from symptoms last fall.

Patient 32, a boy of 17 from the same town. Hay fever from August to frost for three years. He reacted to none of the pollens known to occur in that neighborhood, but insisted that his trouble came from "buffalo grass." He escorted the writer to a field of chloris elegans. Bermuda grass gave a strong reaction, and three doses of 1:10,000 relieved his symptoms for the year.

There is no Bermuda grass within miles of the town where patients 1 and 32 live, so it seems that Chloris and Bermuda grass inter-react.

Patient 37—Hay fever for 15 years; when tested recently reacts strongly to ash, Bermuda, Johnson grass and pigweed; has a nine months' season. Hay fever came on, followed soon by asthma, at its usual time in February. She reacted to ash more than to cottonwood (whole pollens) and was treated with ash 1:10,000. She was 75% relieved until Bermuda grass came on in April. Because of the difficulty of getting an effective Bermuda grass pollen extract treatment was abandoned.

Patient 22 (referred by Dr. Willard Smith). Hay fever for four years; season the preceding year April to October, with lighter symptoms in mid-summer. Reacted strongly to the whole pollen of Bermuda grass and was relieved noticeably by the skin test. This continued to be his treatment until a good Bermuda extract was finally obtained in May. One to 12,000 was given in ascending doses until June 30, though he was symptom-free. He had no further trouble, but is recorded as 75% relieved, on account of the prolonged early treatment.

Patient 23. Hay fever for six years, April to November, with a free interval in July. Found later to react to Ber-

muda and pigweed. Treated by large skin tests and later by Bermuda 1:5000, the last dose, 0.15 c. c., shocking him slightly. Following this he was entirely relieved until the middle of August, and his fall hay fever, usually severe, was light, and probably due to pigweed.

Patient 27. Mild hay fever symptoms all the year, but worse from April to October. Reacted to Bermuda, goose feathers, and streptococcus. Feathers excluded, streptococcus vaccine given, and four doses of Bermuda 1:12,000. Seventy-five per cent relieved; still has trouble on entering certain houses.

Patient 28. First season; reacted to Bermuda and Johnson grasses, but tests were barely positive. She was given a mixture of the two in 1:5000 strength on May 8, and every three days thereafter until May 26, when she was entirely relieved and had no further trouble during the year.

Patient 25. Hay fever for three years; reacts to Bermuda grass only. After six doses of 1:12,000 she reported herself as 75% relieved.

Patient 26. Hay fever for three years, with asthma, April to October. Reacts to Bermuda grass. Seen on May 21st, and given 0.05 c. c. of 1:1000. After this dose his asthma was severe but he had no more hay fever. Doses of 1:5000 solution were given twice a week and gradually increased. After the fourth dose he was free from symptoms but treatment was continued till July first. He was relieved for the rest of the year.

Patient 24. Hay fever for three years; Bermuda grass gave a violent skin reaction. He was treated over the same dates as patient 23, but with a 1:12,000 solution; nevertheless he was severely shocked after one dose; completely relieved.

Patient 31. First season; reacted to wormwood, and weakly to Bermuda grass, although there was no Bermuda grass where she lived. Six doses of wormwood pollen 1:2500 gave no relief. This patient was overdosed with wormwood pollen and probably was

having trouble from chloris, which was present and blossoming at the time.

Patient 40. Hay fever and asthma for 16 years, not strictly seasonal but worst in summer. Tests showed strong reactions to pigweed, salt bush and chenopodium. Two doses of a 1:5000 mixture of these pollens were given, with no benefit. The patient refused further treatment, and she was right. She had a chronic suppurative ethmoiditis, which probably caused the asthma.

Patient 45. Severe hay fever for four years, February to November; multiply sensitized. She was seen in June, and given treatment with small doses of a mixture of the pollens then in the air, Bermuda grass, pigweed, and Johnson grass, 1:10,000. Her symptoms gradually lessened until on July 3rd, when treatment was stopped, she was 75% relieved. This relief continued until late in August, when pigweed came on in abundance and she suffered greatly.

Patient 44. Very severe hay fever for four years, June to September. Reacted strongly to pigweed, salt bush, and chenopodium. Eleven doses of 1:10,000 of a mixture of these gave practically no relief.

Patient 39 was relieved of his symptoms near the end of the pollen season. Pigweed 1:5000 and autogenous vaccine (streptococcus) were used simultaneously, so that result means nothing. Patient 36, treated at the same time and in the same way, got no relief. These cases are not included in the summary of results, nor is patient 49, who reacted to Bermuda 1:50,000 and was slightly shocked by testing with whole pollens. She was 50% relieved by repeated skin tests, and injections of her pollens were not attempted.

In summarizing the results of treatment, it seems desirable to regard the multiply sensitized as having two seasons. For example, patient 23 has hay fever from Bermuda and pigweed. He was treated early with Bermuda grass pollen and his early hay fever 100% relieved; but his late hay fever only 50% relieved. Thus these 13 patients

had among them 16 hay fever seasons. Considering them as 16 patients, five, or 31-plus per cent were completely relieved, the same number were 75% relieved, one patient 50% relieved and five, or 31%, were failures. Practically all the good results were obtained with Bermuda grass. Most of the patients were Bermuda-sensitized, a potent extract of this grass was obtained early in the season, and treatment was begun in the time of heavy pollination and continued into the period when the grass blooms less vigorously. This permitted the use of larger doses and made the intraseasonal treatment a preseasonal one so far as concerns the later season of heavy pollination. The best results were obtained by those who continued their treatment for several weeks after they were relieved.

PRESEASONAL OR PROPHYLACTIC TREATMENT

Twenty-two patients, all sensitized to ash, cottonwood or Bermuda, some to all of these, have begun preseasonal treatment. When possible the method of Walker¹³ is being followed. He begins treatment about three months before the usual time of onset of hay fever with "from 0.1 to 0.2 c. c. of that dilution next higher than the highest one that gave a positive skin test *** given subcutaneously once a week, and each week the amount of the extract gradually increased, * * * until one or more doses of the 1:100 are given." He stops treatment before the pollinating season begins, by preference. His careful analysis of his results, and the extent of his experience, justify this method.

Rackemann¹¹, working in the same city, starts with three times Walker's initial dose and completes his desensitizing course in six weeks. Cooke⁹ grades the strength of his solutions by their nitrogen content, but his dosage and interval are about the same as Rackemann's, except that he continues treatment nearly to the end of the hay fever season—a method obviously unsuited to Arizona. Scheppege¹² gives smaller doses at shorter intervals. All these men get good results. The essen-

tial thing seems to be to start well in advance of the hay fever season, to use the right pollen, not a mixture, and to give as much of it as the individual patient will safely tolerate. A large local reaction, persisting over 36 hours, or a constitutional reaction of any severity, are indications to repeat or reduce the dose and to lengthen the interval between doses.

In the series now being treated, nine are multiply sensitized, and the pollens so far as possible are being kept separate and given on different days. The results of this method will be interesting, as compared to those obtained by using pollen mixtures, which inevitably some will insist on doing.

SUMMARY

Hay fever patients residing in central Arizona have been tested with local pollens, and certain of these have been identified as causes of hay fever. The pollinating season of plants mainly responsible for hay fever in this region has been shown, and their relation to the divisions of the nine-months-long hay fever season has been indicated. The tendency of allergic patients to become multiply sensitized has been shown.

Thirteen patients with sixteen hay fever seasons were given during-the-season treatment with extracts of local pollens. Eight patients with ten seasons were benefited, as was one patient who received preseasonal treatment. The principles of diagnosis and treatment worked out for pollen disease in other sections have been successfully employed.

The causes of spring hay fever in the higher altitudes of this region were not investigated.

CONCLUSIONS

1. Local pollens producing disease are easily identified by the skin test.
2. Treatment with extracts of pollens so identified promises good results.
3. Treatment with one pollen gives better results than treatment by a mixture of pollens.

4. Because of its double season of profuse pollination, with an interval of lesser activity, the intraseasonal treatment of properly selected patients with Bermuda grass pollen is unusually successful.

It is a pleasure to acknowledge my indebtedness to Dr. Warner Watkins, Dr. M. J. Keeney and Dr. Willard Simth for their assistance in this investigation.

St. Luke's Home.

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INTRANASAL PRESSURE

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It is not an uncommon thing to accept a patient's diagnosis of rhinitis and begin treatment without examination. The patient is given some pills to stop the discharge and the spray is used for a number of reasons. If there is pain in the region of the frontal or maxillary sinuses, aspirin is given. Usually, after a number of treatments, the patient feels better, but, as soon as treatment is discontinued, begins to complain again. Should such a case apply for treatment during the summer months, a diagnosis of hay fever is made and, in addition to other treatment, vaccine is used. The result is about the same. However, there are cases that do not respond to such treat-

ment, but are followed by meningitis and death. These cases die because drainage of the nasal accessory sinuses had been obstructed and, without careful examination, could not be re-established.

To make an examination it is necessary to have a good light. Use a small, short-bladed speculum that will dilate the nares without distorting the nose. When a long-bladed, heavy instrument is introduced into the nares much of the mucosa is covered and the turbinate bodies are pushed out of position, making it impossible to get a correct view of the nasal passages and concealing the irregularities that are causing discomfort or endangering life.

The first things noticed during examination will be the condition of the mucous membrane, the amount of room in the nose and whether there is discharge, crusts, ulcers, perforations or polypi; the history gives us an idea what to expect. Next, examine the septum and note whether it is deviated from the median line, has ridges or spurs, or if it is thickened. Inspect the inferior turbinate as to size and position; notice if it touches the floor or the outer wall of the nose or the septum. If it touches the septum determine whether the turbinate is hypertrophic or hyperplastic, or if the septum is deviated, thickened or has ridges or spurs at this point. The nasal duct drains into the inferior meatus under this turbinate. Inspect the middle turbinate in the same manner. The maxillary, frontal and ethmoidal sinuses drain into the middle meatus under the middle turbinate and the posterior ethmoidal and sphenoidal sinuses drain into the superior meatus above it. If polypi are present, determine their attachment in order to discover which sinus is involved, as well as to facilitate their removal. Now examine the other side of the nose, use mirror for posterior examination and then make your decision as to what should be done for the patient's relief. Remember that there may be irregularities in the cartilaginous or bony structures without intumescence and if such is the case little or no treatment is necessary. However, it is usually on account of the intumescence that the examination is made.

When two mucous surfaces within the nose, touch each other they begin to swell and the swelling may be so great that air is excluded; the turbinates may be hypertrophied or hyperplastic, or enlarged as the result of polypoid tissue or there may be polypi present; the septum may be deflected or have large ridges and spurs. These cases are generally correctly diagnosed and given relief. Quite often there is enough room along the floor of the nose, so that no complaint is being made about inability to get air; in fact, the patient will take particular pains to show you that breathing is not ob-

structed on that side, and yet the intumescence may be so great in the upper part of the nose that drainage is seriously interfered with. These patients are not trying to deceive you but are allowing you to deceive yourself, and these are the cases in which, as a result of an incomplete examination, the point of contact between two mucous surfaces is not located and indifferent treatment may be given through a period of months or years, or until an emergency arises. A common cause of such a condition, and one that is most often overlooked, is a thickened septum, high up, with or without any other deviation whatever.

A history of rhinitis, hay fever, pharyngitis, facial or orbital pain, tinnitus aurium or hardness of hearing requires a careful nasal examination.

It is not the purpose of this paper to go into the details of trans-illumination, x-ray and other methods of diagnosing sinusitis or the operations for draining a sinus that is full of pus; nor are we interested in the middle ear or mastoid, except as they are the result of nasal intumescence and it is the relief of the intumescence that we are considering at this time.

The treatment of intranasal pressure is surgical and affords considerable opportunity for the exercise of good judgment. The operation of choice is the one that will correct the irregularities, give proper drainage and air, with the loss of the smallest amount of mucous membrane.

Hypertrophied turbinates must be carefully studied and just enough removed to prevent touching an opposing mucous membrane and should never be entirely removed if this can be avoided, on account of the resultant atrophy, with its dryness and crusts. Better operate twice than remove too much, since painting turbinates, with the intention of stimulating growth, is a slow process and requires considerable enthusiasm.

Polypi, and degeneration of the posterior and anterior tips of the turbinates must be removed; diseased tissue must be removed regardless of the amount or where found.

Intranasal pressure is due to deviation of the septum more often than any other cause and in these cases the submucous resection of the septum should be done. The results of the submucous resection, when well done, are more gratifying than that of any other operation within the nose. Too often the turbinates are operated when the irregularities are in the septum. There is probably no other organ in which healthy tissue is so recklessly sacrificed

as within the nose, and this is not always the result of an incomplete examination, but may be on account of erroneous ideas of nasal function.

In conclusion, it might be well to emphasize the fact that intranasal irregularities may be operated when diagnosed; that there is no necessity for waiting until further complications arise; that the comfort and safety of the patient depends upon such decision.

PUBLIC HEALTH*

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Winslow defines Public Health as "the science and art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will insure to every individual in the community a standard of living adequate for the maintenance of health." It is a science or art which has been built up from the work of physicians, engineers, sanitarians, biologists, sociologists, epidemiologists, statisticians, chemists, economists, and others. Fundamentally, it is based upon the study of life and its processes, individually and collectively in regard to duration and normality.

Public health should be governed largely by our knowledge of the rates of births and deaths, the number, character and duration of diseases, and the amount and kind of physical and mental

defects. This necessitates the prompt collection of accurate statistics, their correlation, and intelligent interpretation. The more faithfully this is performed, the greater our knowledge of conditions with which we have to deal, the better we can apply the most suitable remedy, and more satisfactory will be the results obtained. Indeed, without statistics, public health is like a ship at sea without a compass, without aim, without application and without results. Sir Arthur Newsholme said during his recent lecture before the New York Academy of Medicine: "I may be excused from quoting English figures as our vital statistics are more accurate and complete than those hitherto available for the United States. Parenthetically, may I say that it is a continual source of astonishment to me that in some states your death statistics, and in many more states, your birth statistics should still be so dubious in their quality as to cause hesitation in utilizing them. And this in a country which, in other respects, combines the highest business qualities with an underlying idealism, which emerges in all important crises." To this I can only

*Read at the Arizona State Medical Association Meeting at Nogales, Arizona, April 15th and 17th, 1920.

add, that Arizona is not, I am sorry to say, within the registration area.

Public health work in the past has shown remarkably effective results in the control and eradication of communicable diseases. Bubonic plague, cholera and yellow fever are medical curiosities. Smallpox, typhus, and typhoid are rapidly becoming so, while the incidence of tuberculosis is, by the best figures obtainable, declining. The more recently inaugurated campaign against venereal diseases is in most efficient hands, and should result in a great saving of life and of much disablement. Public health work along the lines of tuberculosis should not lose sight of the theory that as we eradicate an infection, we also tend to eradicate or prevent other infections. Allen Hazen said as long ago as 1904 that "when one death from typhoid fever has been avoided by the use of better water, a certain number of deaths, probably two or three, from other causes, has been avoided." Also, in this connection, Sedgwick and McNutt state that "they are forced to the conclusion that a considerable portion of the decline in mortality from tuberculosis in Lawrence and Lowell during the years immediately following a change from a polluted water supply, was due to that change." Again, Raymond Pearl, in a recent paper dealing with our influenza epidemic said, "Communities, in some degree organically unsound as indicated by relatively high normal death rates from phthisis, organic heart disease and nephritis, were less able to meet successfully the attack of a vicious epidemic invader, than were those in which these biologic conditions did not exist." As we have less typhoid, we have less tuberculosis. As we have less organic heart disease and nephritis, both of which are largely infectious diseases, we have fewer deaths from influenza, and undoubtedly fewer deaths from tuberculosis. And, lastly, if we have less focal infection, particularly of teeth, gums and tonsils, the death rate, not only for infectious diseases but for all diseases, will, without question, be greatly reduced.

The eradication of organic diseases of the heart and kidneys, the two conditions that contribute so very largely to our list of death and sickness is almost entirely in the line of prevention, and when we take into consideration the relative importance of these diseases, public health should bend every effort to reduce them to the minimum. As these diseases begin to show themselves early in life, it is necessary to start preventive measures in the very young, probably best in the preschool age, by using every means in our power to prevent infections of all kinds, measles, scarlet fever, whooping cough, colds, diseased tonsils, adenoids, and especially, infected teeth and gums. Also, the child's resistance to infection should be built up, its nutrition should be maintained at the maximum, and its physical vigor and endurance promoted by suitably regulated rest, exercise and recreation. These measures started during the preschool age should be maintained throughout childhood and school life.

When an individual leaves school to enter upon the stress and trials of his life's work, he should be, and he has a right to demand that he be, not only physically and mentally well trained and sound in every respect, but that he be so well drilled and exercised in the care and preservation of his body that it will carry him to a good old age, at least free from preventable diseases. It should be emphasized that this work is purely public health work. It is for the prevention of disease, the prolongation of life, and for greater efficiency during life. This work should be part of the organized effort of every community, and should be carried on through the community officers of public health, and by no other agency. Relative to this, McLaughlin of Washington, D. C., says: "The aims of health departments are, the eradication of preventable disease, the elimination of corrigible physical and mental defects and the maintenance of all individuals in the best possible physical and mental condition."

Public health, to be successful in any community, should have the hearty cooperation, backing and intelligent understanding of the individuals of that

community, and to have this, it is necessary that they be frankly dealt with, instructed and educated in the knowledge of public health. Every opportunity should be utilized for talks, lectures, exhibits and courses in study pertaining to public health.

In the furtherance of this idea there has been recently established in Bisbee a health center whose aim is to stimulate and encourage an interest in personal, community, state and national health conditions, first, by centralizing and correlating all local health activities; second, by the diffusion of knowledge of health and its preservation; third, by encouraging, supporting and assisting health officials in the proper performance of their duties; fourth, by investigating conditions appertaining to health and its betterment; fifth, by initiating and supporting needed health legislation.

Its organization consists, (1) of a central committee of three appointed by the executive committee of the Red Cross Chapter, one member from the Chamber of Commerce, one from the American Legion and one from the Red Cross, one member to be a woman,—this committee shall organize, direct and be responsible for the policies, ac-

tivities, administration and results of the health center; (2) of an advisory committee composed of representatives from the various civic organizations of the community and such other persons as the central committee may appoint; (3) of sub-committees appointed from the members of the advisory committee on administration, legislation, instruction, investigation, schools, centralization, consultation, etc.

The organized personnel shall be composed of persons of recognized standing in the community and as representative as possible, public officials and medical men being ineligible. The underlying motive is education of the public in constructive health work, along preventive lines.

In conclusion, I wish to quote from an article by Dr. L. Haden Guest, an English medical officer, written in the trenches in France: "Here (referring to the fighting lines) they are equipped with everything that can be given, but they cannot be equipped with a physical health and efficiency greater than their childhood has left them. Only care of childhood can give us adult men of that force and vigor which is latent in our race, but which often bad conditions deform or suppress."

THE PREVENTION OF ACIDOSIS IN THE TREATMENT OF DIABETES: *Abert.*, Journal-Lancer, Jan. 15, 1922, p. 33.

This paper follows the work of Joslin, and discusses the chemistry of acidosis; his conclusions are:

(1) Acidosis is not an acid condition of the blood and body fluids but a depletion of the alkali reserve of the body.

(2) The cause of acidosis is the overproduction of non-volatile acids, which fix base and deplete the alkali reserve.

(3) The great source of these acid bodies is the combustion of fat without the presence of carbohydrates.

(4) Consequently, to prevent or treat acidosis, we must avoid all fat and push the carbohydrate intake.

(5) The rational treatment of diabetes must ever be based on these principles.

(6) In the treatment of coma, alkali therapy is dangerous and should be abandoned.

A DISCUSSION OF THE NEWER METHODS IN THE TREATMENT OF DIABETES: *Joslin*, Sou. Med. Jour., February, 1922, p. 93.

In this address before the Southern Medical Association, Joslin referred to the fact that the mortality from diabetes had been reduced from the 1914 figure of 28%, to 2% in 1920. This has been the result of the clinical application of the results of laboratory workers in metabolism. He emphasizes the fact that, while the coma of diabetes is due to acidosis, alkalis will never prevent nor relieve diabetic coma. In his last 525 cases, no alkalis have been given. He regards the three great advances in the treatment of diabetes as the banishment of drugs from the treatment, the recognition of fat as the cause of coma and the treatment by undernutrition.

THE TREATMENT OF ACUTE PERITONITIS*

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The term peritonitis, when applied with the usual careless unscientific generality, covers as many abdominal ills as charity does moral ones. The reaction following the introduction of a sterile substance into the peritoneal cavity, or the salutary inflammation which results in limiting adhesions around an infective focus, are frequently described in the same terms as we define the condition caused by an acute bacterial infection, with its train of local symptoms, and showing the clinical effects of toxemia, and septicemia. This latter condition has, at some time, been further, and more aptly, described as acute peritoneal infection, the treatment of which is the subject of this paper.

The treatment of acute peritonitis, while logical and based on sound physiological principles, is more or less inefficient and uncertain. Until the unknown equations of individual resistance and the difference in virulence of the same type of infection are solved, we can only expect a comparative efficiency and accuracy. If this were not true, surgery, as applied to the abdomen, would indeed be an exact science, and its possibilities could hardly be proscribed. We may say that the discovery of anesthesia made abdominal surgery possible; that the introduction of antiseptics and asepsis made it practical; and that the perfect development of efficient and accurate treatment of peritoneal infection would make it ideal.

The peritoneum is a serous membrane, which lines the abdominal cavity and partially invests the viscera contained in it. It is extensive, being only a little less than the cutaneous surface. It consists of an endothelial covering upon a limiting membrane, beneath which there is a framework of connective tissue, richly supplied with blood vessels and lymph channels. The clas-

sical illustration of a closed sac superimposed upon the abdominal viscera is apt. The peritoneum covering the viscera is merely a number of reduplications of the parietal peritoneum, and the peritoneal cavity contains nothing but the omentum, and is nothing but a giant lymph space.

One of the functions of the peritoneum, the study of which is of the greatest practical importance in the treatment of peritonitis, is its absorptive power. The normal peritoneum has the power of absorbing from 3 to 8 per cent of the entire body weight in one hour. All portions of the membrane possess this power, but not in the same degree. The activity of absorption of any area is in direct proportion to the number, and size of the lymphatics draining that area. Clark says: "Fluids and solids may pass through the endothelial layer of the peritoneum, the fluids in many places, but the solid particles, as bacteria, only by means of the omentum and the diaphragmatic peritoneum. The anatomical reason for this is that under the endothelium of the diaphragmatic and enteronic regions are numberless vast lymph spaces, while the lymphatics of the pericecal, pericolic, and pelvic regions are comparatively few and small. This fact accounts for the virulence of infection of the former and the tolerance of the three latter regions.

Absorption from the peritoneal cavity is done almost entirely by means of the lymphatics. The route of the peritoneal lymph is to the mediastinal nodes, and from these, by means of the thoracic ducts, to the subclavian veins. This absorption has been demonstrated by numerous observers to occur quickly. Woolsey found that after injecting a solution of coloring matter into the peritoneal cavity of a guinea pig, the animal could not be killed quickly enough to find the mediastinal glands free from such substance. Muscotello

*Read before the El Paso County Medical Society, April 19th, 1920.

sums up the result of his experimentation along this line in these words: "That absorption from the peritoneum is practically nil except by the lymphatics, the blood vessels playing an indifferent, if any, part in that action."

These foregoing facts have been abundantly proven and are true. Then it must follow that the clinical phenomena which we associate with acute peritonitis, are caused by the lymphatic absorption of toxic material from the peritoneum, which material being poured into the circulation, causes a general toxemia. I am led to discuss this phase of the matter, because of certain teaching, which, if true, makes the treatment as generally accepted and practiced, illogical and empirical. In one of the most recent and popular text books there is this statement: "The danger of peritonitis is not so much from the absorption of toxic material from the peritoneum, as from paralysis of the intestine due to infiltration of its walls with the products of inflammation." If this be true, then the use of the semi-sitting position and the inhibition of peristalsis are absurd, for these methods only tend to minimize the systemic, and not the local absorption. If this be true, then the treatment of twenty years ago—salines, copious irrigation, and massive drainage through opening, and counter opening, would be more logical than that of the present day.

But it is not true. The paralytic condition of the intestine in acute peritoneal infection is caused by a general sympathetic nervous system poisoning, and is an effect rather than a cause. In all diseases which are characterized by the production of toxins which greatly involve the sympathetic system, notably typhoid fever and pneumonia, there is frequently present the same condition, except in degrees. In acute peritonitis there are invariably sympathetic phenomena—as disturbance of the cardiac, respiratory, and vaso motor centers, which precede or, at least, are co-existent with the abdominal sympathetic involvement, which causes this paralytic condition of the intestine. Furthermore, the most acute, virulent forms of peritoneal infection may, and often do,

produce death in a few hours, leaving hardly a macroscopical trace in the peritoneal cavity or the walls of the intestine.

The treatment, therefore, is that of a general toxemia and may be classified as preventative, curative and symptomatic.

PREVENTATIVE TREATMENT

Preventative treatment demands three essentials:

First: Removal of the source of infection, which may be done by the excision of a part or the whole of an infected tissue, or by draining an infected area.

Second: By prevention of the spread of infection. Avoid irrigation of the peritoneum when possible, for this will cause a further dissemination of infectious material, and the establishment of veritable cess pools in the most dependent portions of the peritoneal cavity, a condition most favorable to the further development of peritoneal infection. Avoid, in so far as possible, breaking down adhesions around an infected area, and wall off carefully before attacking a possible focus of infection.

Third: An adequate technic. The peritoneum possesses a remarkable facility for the removal and neutralization of toxic bodies, due to the great bactericidal properties which it has. These powers are dependent for their proper functioning upon the normal condition of the endothelial cells. Flexner says, "In order that pathogenic bacteria introduced directly into the peritoneal cavity may cause a peritonitis, general or circumscribed, the normal condition of the peritoneum must in some way be modified." This protective property is diminished in direct proportion to the amount of injury done to the peritoneum. Then avoid vigorous sponge cleansing, or unnecessary manipulation of the peritoneal surfaces. Do not allow the peritoneum to become chilled or dry. Avoid, in so far as possible, doing anything which will traumatize, or devitalize the peritoneum. Avoid any technic which will cause depression or shock, as an improper anesthetic, traction on the mesentery or parietal peritoneum, rude manipulation, and unnec-

essary exploration. Avoid waste of time. Find what is to be done, do it, and get out. These common surgical sins tend indirectly to further the development of peritoneal infection, because they lower the resistance of the patient. As Nancreede says, "No perfection of aseptic technic, will invariably render innocuous, faults or misfortunes of operative technic."

CURATIVE TREATMENT

The curative treatment of acute peritonitis, consists in limiting the absorption of toxins, and in diluting, and promoting the excretion of them when absorbed.

The absorptive power of the peritoneum is diminished by the backward pressure of venous engorgement which, in turn, produces a lymphatic obstruction. This end is most practically attained by intravenous infusion, by hypodermoclysis or proctoclysis.

Intravenous infusion with Ringer's or normal saline solution is more indicated in emergencies, where there is not time for the slower methods. It is well to bear in mind Murphy's dictum, that all intravenous medication is major surgery. Don't give too much, as this may seriously embarrass the heart, and, if possible, always use a freshly distilled solution, as an unfortunate reaction at this time might destroy the balance which the patient has thus far maintained.

Hypodermoclysis with normal saline does not fill up the circulatory system as rapidly as the preceding methods, and for that reason is not so apt to have an untoward effect. Crile advocates the use of 2500 to 3000 c. c. of saline solution by hypodermoclysis every 24 hours until the danger point is passed, as an adjuvant to proctoclysis, which is begun at once and continued as long as tolerated.

Proctoclysis may and should be used ad libitum. It will not embarrass the circulatory system, and it allows the use of antacidosis agents, as well as nutriment materials. Many solutions are used, from plain tap water to heavy saline,—the most popular formula, probably, being glucose and sodium bicarbonate 5% each. It would be well

if these solutions were better standardized, so that a more practical application be had of the laws of osmosis.

Filling up the circulatory system by the above methods not only limits absorption from the peritoneum, but causes increased dilution and elimination of toxins; it allays hunger and thirst, and reduces temperature.

Absorption of toxins from the peritoneum is limited by position. Regardless of posture there is a normal force which propels intraperitoneal fluids and solid particles toward the diaphragm. Buxton and Torrey have proven that after the injection of bacilli into the peritoneal cavity, there is an immediate rush to the lymphatics of the diaphragm, thence to the mediastinal nodes, thence to the thoracic duct. It has been proven that by injecting bacilli into the peritoneal cavity of a dog, suspended head down, the bacilli could be demonstrated in the mediastinal glands in six minutes; while the same experiment, but with the animal suspended in the reverse position, showed the mediastinal nodes free from the bacilli for nearly five hours. We make application of this principle in the semi-sitting or Fowler position.

Therefore, as soon as the patient has recovered from the shock incident to operation, he should be placed in as nearly a sitting position as practicable. This drains the toxic material away from the most dangerous areas, to ones of comparative safety, and in this way not only limits absorption, but materially assists cardiac and respiratory action by minimizing the intraabdominal pressure against the diaphragm.

Absorption from the peritoneum is limited by controlling peristalsis. If this be not done, limiting adhesions will be unformed, or broken down, and infection be carried to other parts of the peritoneal cavity. To control peristalsis we have these agents,—complete abstinence of anything by mouth, avoidance of high enemas, and the use of opium. Opium not only minimizes peristalsis, but it protects the patient from nerve exhaustion, and consequent shock. Crile advocates administering opium in this condition, until the respiratory rate is reduced to 12 or 14 per minute.

SYMPTOMATIC TREATMENT

Gastric lavage is of the greatest value in peritoneal infection. It removes the backed up duodenal contents which are exceedingly toxic, and is further indicated because it minimizes the gastric pressure against the diaphragm.

As the immediate cause of death in acute peritonitis is from vaso motor paresis, then adrenalin is of value,—at least theoretically—in increasing vascular tension. Pain is, of course, controlled by opium. Cardiac and respiratory stimulants should be used as needed. It is not practicable to indicate by any routine treatment the employment of these remedies. They are beneficial agents, and must be applied according to the need of the individual.

Treatment of acute peritonitis by draining the thoracic duct. The reason for this is based on the following facts:

First: That death from acute peritonitis is caused by a general toxemia, and that intestinal, respiratory, cardiac, and vaso motor disturbances, are but local or special manifestations of this toxemia, which is produced by the absorption of toxins from the peritoneal cavity.

Second: That this absorption of toxins is nearly entirely carried on by the lymphatics, and that these lymphatics empty this poisonous material into the mediastinal glands, and from these it is poured into the circulation principally, if not entirely, through the thoracic

duct. This being true, it is only reasonable to assume that the prevention of the entrance into the circulatory system of this toxic material, by drainage, or section of the thoracic duct, should prove of great value.

The thoracic duct is practically inaccessible for its entire course, except at the base of the neck, where it curves downward, forward, and outward, and empties into the subclavian vein at its angle of junction with the left internal jugular. At this point it becomes comparatively superficial, being covered only by the skin, platysma, sterno mastoid muscles, and cervical fascia. Drainage of the thoracic duct may be most readily done by the following method. Sand bag under base of the neck, a little to the left. Head turned to the right side; left shoulder depressed. Three-inch incision along the posterior border of the sterno mastoid followed by partial resection, and retraction of this muscle. Incise the deep cervical fascia, and by careful dissection locate the internal jugular. Follow this to the point of junction with the subclavian vein, where the thoracic duct may be found and resected. The only disadvantage, or danger of this operation is that incident to all operations. The advantage is, that it might afford relief for a condition which is only too frequently hopeless. This fact, together with the sound anatomical and physiological principles on which it is based, should make it worthy of at least a trial.

ARMY EXPERIENCES WITH TENDON TRANSFERENCE: *Starr*, Jour. of Bone and Joint Surg., January, 1922, p. 2.

The principles requisite to success in this type of surgery is laid down by the author as follows:

(1) Whenever possible, muscles having similar actions to the ones they are to replace should be used; (2) Where only a portion of a tendon is to be transferred, it MUST have the same action as the muscle it is to replace; (3) Line of pull should be straight; (4) Fixation of the transferred muscle should be with a good deal of tension; (5) Any de-

formity due to contraction of tissues should be overcome before transfer of muscles is attempted; (6) Sheath of the muscle replaced may be used for the new tendon, but usually transferred tendons are run in the subcutaneous fatty tissue; (7) In the lower extremity, the tendons transferred should be inserted into bone or periosteum—in the upper extremity, attachment of tendon to tendon has been satisfactory; (8) Adequate fixation of tendon to tendon; (9) Immobilization for three weeks; (10) Expert training afterwards.

A number of case reports, chiefly of transference after musculospiral injury are given.

TENDON TRANSPLANTATION IN THE FOREARM*

R. D. KENNEDY, M. D., F. A. C. S., Globe, Arizona.

Tendon transplantation in the forearm, following injuries to the musculo-spiral or posterior interosseous nerves, which are not susceptible to repair.

When the injury to the musculo-spiral is above the nerve supply to the extensors of the wrist, it is necessary to transplant the pronator radii teres into the paralyzed extensor carpi radialis longior and brevior. In doing this, one must bear in mind the very short tendon of the pronator radii teres.

An incision is made over the insertion of the pronator radii teres, the supinator longus retracted inward exposing the pronator. With a knife, divide the periosteum around the insertion of the pronator and, with a periosteal elevator, separate the tendon from the bone taking with it the periosteum. In attempting to do this without taking the periosteum, the tendon, which is very short, is liable to be so frayed that there will not be enough left to transplant.

With the tendon separated and the muscle freed for a short distance upward, the extensor carpi radialis longior and brevior are exposed through the same incision lying about a half an inch to the outside. The wrist is then dorsoflexed and the tendons drawn up sufficiently to keep it in this position. A slit is made laterally through these tendons and the tendon of the pronator drawn through and sutured with chromic catgut. In suturing, only one-half of the transplanted tendon is sutured to one-half of the tendon into which the transplant was made, so as not to interfere with the nutrition of the tendon. Catgut is used in place of silk as there was thought to be fewer adhesions and less interference with function.

The assistant must be careful not to allow the wrist to become flexed. The opening in the sheath of the tendons is

repaired as much as possible with plain catgut. The small skin incision is now closed. The rest of the operation is the same as used for destruction of the posterior interosseous nerve.

For transplantation after posterior interosseous nerve injury, an incision is made in the skin beginning about two inches above the styloid process of the radius, a little to the anterior surface, running down to the insertion of the adductor longus pollicis, from here swinging in a circle across the dorsum of the hand about three-fourths of an inch below the radio-carpal joint. This part of the incision is so placed as not to have the line of skin suture and tendon transplant superimpose thus doing away with any possible adhesions between line of skin suture and transplant. The incision now swings upward outside the styloid process of the ulna, and extends up the forearm about two-thirds of the way to the elbow, to enable the operator to dissect the flexor carpi ulnaris free well up towards its origin, so that when transplanted it will lie on a straight line from its origin to point of transplant. If this is not done and the tendon is transplanted with a curve it will fail to functionate properly. The skin flap is dissected back on the dorsum of the hand to expose the tendons of the extensors of the fingers and thumb.

The flexor carpi radialis is now exposed about the junction of the middle and upper thirds of the arm and isolated through a small incision directly over the lower end of the muscle belly. The tendon is divided at its insertion and withdrawn through this opening. With a blunt instrument a new path is made from the styloid process of the radius to the small opening through which the muscle was withdrawn, and the tendon brought down through this path and transplanted into the adductor longus pollicis and the two extensors

*Read before the Medical and Surgical Association of the Southwest, at El Paso, December, 1919.

of the thumb, after the thumb has been extended and abducted by the assistant. This transplant is done in the same manner as the previous one by making a small slit in the tendons and drawing the transplanted tendon through the opening in such a manner that the thumb will be held in extension. The tendons are now sutured in the usual way and the sheaths repaired as well as possible to prevent adhesions. The flexor carpi ulnaris is now divided at its insertion in the pisiform, care being exercised not to injure the ulnar nerve at this point as it lies very close. The muscle is dissected up to a point opposite the junction of the middle and upper third of the forearm. The tendon and muscle are now swung over the ulna and inserted into the extensors of the fingers in such a manner as to give it a straight pull, the fingers and wrist being extended. This transplant is done the same as the other.

In closing the skin, care must be exercised to get it back in place along its former line; the hand being dorsiflexed makes this somewhat difficult so it is better to suture the angles first and see if there is much tension of the skin over the dorsum of the wrist.

The hand is put up on a cockup splint with the thumb, finger and wrist extended. At the end of ten days a few gentle passive movements are begun. At two weeks a few active movements are begun daily, teaching the patient to use the transplanted flexors for their new function. At three weeks the splint is discarded in the daytime but continued at night for another week, after which time no appliance is used. By this time, the patient has learned to use the transplanted muscles very well and in a short time these movements become so automatic that the patient never gives them a thought.

A CASE OF SYPHILIS WITH BONE LESIONS*

DAVID C. DODDS, M. D., Albuquerque, N. M.

The case to be reported probably presents little that is not well known. The interest is in the general character of the case; in the history of past positive lesions, past doubtful lesions and in the present lesions; in the question as to whether the case is one of hereditary or of acquired syphilis; and, lastly, in the progress of the case under treatment. In this connection, I wish to thank Dr. Van Atta for his interest and advice, and for the series of follow up plates which has made it possible actually to watch the process of repair taking place.

CASE REPORT

FAMILY HISTORY: Father healthy, of

healthy parentage; has a well compensated mitral lesion; admits gonorrhea but denies syphilis. Mother healthy, of healthy parentage; no miscarriages. Three children; one stillborn at term, a large child (11 lbs.), perfectly developed, evidently a birth injury; girl of ten years, healthy, at this time 52 inches in height and weighs 60 lbs.; the patient, a girl of 12 years, is 50 inches high and weighs 45 lbs.

PAST HISTORY: As a child, patient had been healthy up to the age of seven. Photographs previous to that time show her to have been a rather fleshy child. At seven, she had an attack diagnosed as typhoid; it appears that a Widal test was made; at any rate, the diagnosis would, ordinarily, not be questioned. Recovery was slow and, in fact, the previous health was never regained. The throat now began to give trouble and, after a time, the tonsils were removed. No improvement followed this. Just before the typhoid

*Read before the Thirtieth Annual Meeting of the New Mexico Medical Society at Albuquerque, April 29th and 30th, 1921.

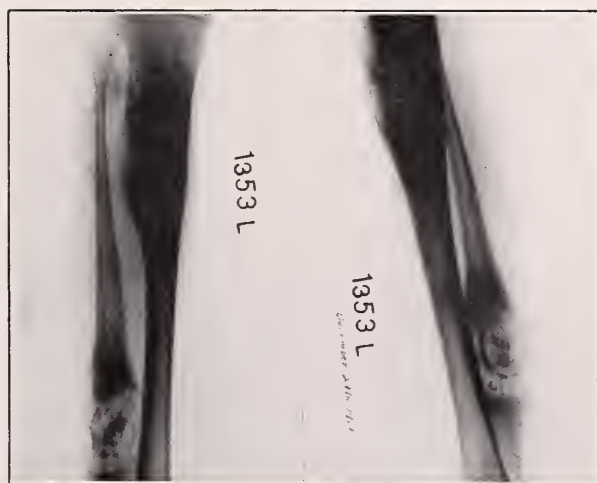


Fig. 1. Made Dec. 29, 1919, showing syphilitic osteomyelitis of lower third of fibula and upper third of tibia.

attack, the family had gone to a southeastern state. Afterward they removed to Michigan and, while there, a physician diagnosed the case as syphilis and began treatment with potassium iodide and mercury inunctions. Improvement was prompt. This physician was killed in an accident and the parents, probably not realizing the seriousness of the case, did not have treatment continued. Sometime later, they returned to their old home near Dallas, Texas. The girl was again growing much worse and they went to a hospital in Dallas, where a diagnosis of pulmonary tuberculosis was made, confirmed (?) by x-ray. We have not seen this plate, but the written report would not warrant this diagnosis from the x-ray. The parents then gave the history of the specific treatment. The hospital staff then had a Wassermann made, which was positive. The diagnosis was then changed to tuberculosis and syphilis, and an unfavorable prognosis given. To try the effect of climate, the family came to Albuquerque. They had lived here about half a year, with the child's condition growing steadily worse, when I was first consulted. The parents were inquiring for the cause and relief of the "rheumatism" which was developing. I may add that, until I had told the parents that the case was probably syphilitic, I did not get any of the above history of positive findings.

PHYSICAL EXAMINATION: Girl, small for 12 years, poorly nourished, inclined to be peevish; coughs a great deal with much expectoration; tires easily and walks with a noticeable limp. Eyes, ears and nose negative. Teeth negative, except eruption is in poor alignment. Tonsils have been removed. The chest fails to show any signs distinctive of tuberculosis. Just below the left knee, on the inner surface of the tibia, is an enlargement, hard and not tender to pressure. About three

inches above the ankle, on the outer side of the fibula, there was a more noticeable enlargement, hard and slightly tender on pressure. This last is the point causing the lameness.

DIAGNOSIS: Sarcoma was excluded because of the absolute lack of any history of trauma, and because there were two separate and distinct lesions, neither of which could be secondary to the other. Tuberculosis was excluded for the same reasons, and because, in addition, there was no pain and the processes were proliferative in character. As the history, when obtained, was so distinctly positive, no Wassermann was made, but an x-ray was asked for. In going over the case with Dr. Van Atta, our conclusions were that this was more probably acquired than hereditary; that the tonsillar trouble had been gummatous at the time they were removed; that the typhoid could have been syphilitic; and, finally, that the proper treatment given at the one time had retarded the progress to an extent which allowed us to deal with a tertiary stage without the least sign of involvement of the nervous system.

The first radiogram (Fig. 1) was made and treatment started the first week in January, 1920. On seeing the plate, our wonder was that the bone had not broken. The girl was taken from school and only necessary walking allowed. Treatment began with .1 gm. potassium iodide, *ti. i. d.*, and a weekly injection of mercury salicylate, .065 gm. in the gluteal muscles, for four weeks. An initial dose of .2 gm. neoarsphenamine was given one week later, and was followed by weekly injections of .3 gm.

for seven weeks. This course was interrupted midway by giving one dose of mercury cyanide, .0027 gm., and sodium cacodylate, .16 gm., stopping the potassium iodide three days on either side of this injection. Following the neoarsphenamine, four deep injections of mercury salicylate at weekly intervals were given. This course was also interrupted to give a single injection of mercury, double the former dose. Potassium iodide was discontinued during this course of mercury.

During the month of March, there was an attack of coryza or mild influenza and all medication except the potassium iodide was left off for two weeks. By April 1st, soon after the second radiogram (Fig. 2) was made, the improvement was so marked that the patient was allowed to re-enter school.

Following the second course of mercury, the weekly doses of neoarsphenamine were resumed, interrupting with mercury cyanide and sod. cacodylate after the third and sixth doses. Potassium iodide was also started with this, but a slight gastric disturbance

caused this to be stopped. With the last part of the series of eight injections, the potassium iodide was resumed. This course was followed by a course of mercury inunctions, 4 gm. five times a week, for eight weeks. Potassium iodide was given over a part of this course and for a short time following.

About October 1st, the second half of the treatment was begun, being practically a duplication of the first half. The neoarsphenamine, however, was given in .45 gm. doses and instead of the mercury salicylate, the mercury cyanide and sod. cacodylate were used. This change was made because of the pain and continued soreness of the deep injections. Potassium iodide was given interruptedly during this period, always keeping three days away from the mercury cyanide. The potassium iodide was also given with the final course of mercury inunctions.

This treatment is the same, with the slight modifications as one given in the Jour. A. M. A., for Nov. 29, 1919. Summarizing the treatment: This patient had, within a period of 16 months, a



Fig. 2. Made March 2, 1920, after two months' treatment. Distinct evidences of repair in both lesions.



Fig. 3. Made May 15, 1920, four and a half months after starting treatment. Note the normal appearance of the new bone around both lesions.

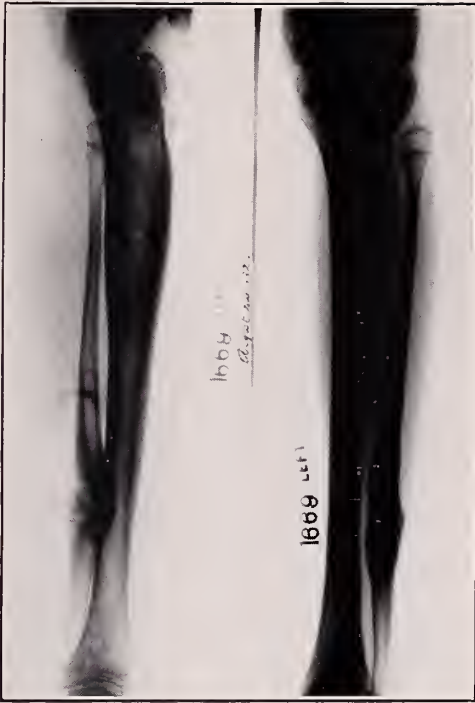


Fig. 4. Made August 22, 1920, nearly eight months after treatment was begun. Tibia shows only a very small area and fibula has formed a strong bridge of normal bone.



Fig. 5. Made Nov. 17, 1920, ten and a half months after treatment started. Tibia shows no evidence of disease and fibular lesion is limited to a small area of periostitis.

daily dose of 3 gm. of potassium iodide fully three-fourths of the time. Intravenously, she was given 32 doses of neoarsphenamine, the initial dose of .2 gm., with 15 doses of .3 gm. and 16 doses of .45 gm., together with 10 doses of mercury cyanide and sod. cacodylate of practically the same arsenical content. Intramuscularly, she received eight injections of mercury salicylate, .065 gm., and 80 inunctions of 4 gm. mercury each.

When starting this treatment, I considered that I was giving intensive treatment. In the light of work of the past year and some previous to that, this cannot be so regarded. I have given instructions for continuing treatment, at intervals, during the next two years with mercury and iodide. We will have a Wassermann test made in about three months from the end of continuous treatment.

At present, the girl is apparently in perfect health. Her height now is 54

inches and her weight 65 lbs., a growth in one year of four inches and a gain of 20 lbs. in weight. There is no trace of lameness. The girl is as active as normal. There is no noticeable deformity at the site of either lesion and radiogram shows the condition of the bones at this time.

NOTE.—The last plate was made after this paper was presented and shows continued progress. A Wassermann, made July 23, 1921, shows a 4 plus positive. The patient has continued to gain and at this time, February 15, 1922, she is 57 inches in height and weighs 71 pounds. Treatment has continued during the time since the paper was presented with inunctions of mercury and potassium iodide internally.

DISCUSSION

DR. TULL: I would like to say that this case came up at our County Medical Society and we thought it very interesting; indeed, sufficiently interesting for us to request the Doctor to present it to the State Society, and we would like to hear some discussion of it.

DR. BENNETT: This was an interesting paper to the general practitioner. We have a number of cases that come to us that are syphilis and a great many of us do not like to go to work to try to do what we ought to do with them. We pass them up. We don't go after those cases as we should go after them. The general practitioner doesn't care to touch it; doesn't care to fool with it, and we, in our general practice, see those cases. We see those cases in the Indians. I know it is there, and while it is impossible for a man working with the Indians as a rule to do anything with them, we know that that work is right there. This ought to be an interesting paper for the general practitioner. It shows that a man can do something with a case that looks impossible, and a great many times we find syphilis where we are not looking for it, and it is worth while to make a careful diagnosis and then take up a good treatment.

DR. KINSINGER: The paper is a very interesting one and the demonstration very excellent, and we old men who have practiced medicine for many years and see the failures

that we made of diseases that, at that time, were certainly difficult of diagnosis and remained so, but during this recent war our eyes were opened. Among the apparently healthy soldiers in the army were obscure troubles, pain and nodular formations on some portions of the bony part of the body. By the use of the x-ray and the Wassermann the diagnoses were clear and cure effective.

I think, as the Doctor has just stated, that we should be more careful in these cases which are obscure and difficult of diagnosis,—patients who do not respond to treatment,—to suspect at least sufficiently to attempt to make the diagnosis by those two methods and apply the treatment heroically until you have made a cure as the doctor has done with this. I think it is splendid work, and I think the doctor is entitled to great credit for bringing this before the society to open our eyes as to what may be accomplished by careful procedure in those cases.

DR. DODDS: I have nothing further to add to what is in the paper but I thank you, gentlemen, for your attention.

DELAYED UNION AND NON-UNION OF FRACTURES: *Nutter*, Jour. of Bone and Joint Surg., January, 1922, p. 104.

This classical article, with extensive bibliography, discusses many of the problems which beset the surgeon in fractures. Distinction is made, in the outset, between delayed union and non-union. By delayed union is meant a retardation of the process of normal bony consolidation of a fracture. Non-union is only to be diagnosed after exhausting every means to promote union, short of operation, faithfully and for many months. Non-union should only be applied to those conditions in which the bones cannot be expected ever to unite without surgical interference. Non-union should not be diagnosed until from six to twelve months have elapsed since the fracture.

Causes of delayed union may be general, like syphilis and other constitutional conditions, such as malaria, starvation, hemorrhage, pregnancy and lactation, acute febrile diseases, etc. The locally acting causes are, chiefly, (1) Non-apposition; (2) Faulty immobilization; (3) Sepsis; (4) Local disease at the fracture, such as tumors, cystic disease, scurvy, osteomalacia, gumma, tuberculosis, etc.; (5) Defective blood supply; (6) Foreign bodies at site of fracture. Non-union is practically always either due to the interposition of soft parts between the fragments or to loss of large fragments of bone.

Treatment of delayed union; do not interfere too soon. In a fracture of the femur, for example, if union has not occurred at the end of ten weeks, be sure of three things,—good alignment and length, good immobilization and a good blood supply. If these essentials are present, let it alone for three or three and a half months. If union is still lacking then, passive congestion by damming above and be-

low the fracture is excellent treatment (this treatment was originated by H. O. Thomas, being later developed by Bier and usually called "Bier's hyperemia"). Baking and massage are indicated adjuvants to the hyperemia. The injection of irritants, of tissue fluids, of blood from the patient, or fibrin from horse serum between the fractured bones are not encouraged. Andrews method of drilling down upon the bone ends, or the open operation of Wildey, are commended, although the latter should be reserved as a treatment for non-union. Both are designed to release osteoblasts from the medullary canal.

The treatment of non-union is discussed at length, preference being given to the use of bone grafts, after freeing the ends of the bones from any interposed soft tissues, and removing any tissue which has sealed over the ends of the bones.

Fracture of the femoral neck, the author says, is the exception rather than the rule, not more than from 15 to 30% of these fractures acquiring bony union. He recommends the bone peg in these cases also, in preference to metal spikes.

Where delayed union or non-union is due to sepsis, time is the chief factor. There is a time, given by Gallie at from three to five months after the fracture, when osteogenesis is at its height, vascularity is greatly increased, callus is abundant and the septic infection usually has run its course. This is the most favorable period to seek union, by clearing away all the septic tract and other barriers to union, and seeking apposition, with immobilization.

Bone-grafting, following sepsis, offers difficult problems. Here, the radiograph will probably give the most reliable information as to the presence or absence of active bone disease.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

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NEW MEXICO MEDICAL SOCIETY MEETING

The Fortieth Annual Meeting of the New Mexico Medical Society will be held at Gallup, on April 28 and 29th. A partial list of the papers is given below, from which it will be seen that this bids fair to be one of the highest class meetings ever held in the Southwest.

The New Mexico Society has learned, as have other societies, that their best meetings result when medium-sized cities are selected as meeting places, because, then, the majority of the doctors in attendance have nothing to distract their attention from the business in hand. Gallup is in the northwestern part of the state, on the main line of the Santa Fe; it is an important industrial center, being a railroad distributing point and coal mining section.

The McKinley County Medical Society, which has charge of the arrangements, will have everything in readiness for the meeting, although at the time of our going to press, their full program was not available. Among the outside guests who will present papers are the following:

Dr. Peter P. Vinson, of the Mayo Clinic, will have a paper on "Diagnosis and Treatment of Cardiospasm."

Dr. Nelson W. Janney, of Los Angeles, will speak on "The Dietetic Man-

agement and Complications of Diabetes."

Dr. Titian Coffey, of Los Angeles, will give a lantern slide demonstration of "Repair of the Curvix Nine Days After Delivery."

Dr. George Piness, of Los Angeles, will have a paper on "Present Aspects and Etiology and Treatment of Bronchial Asthma."

Dr. Willis W. Waite, of El Paso, will have a paper on "Waste Products and Their Elimination."

Dr. E. C. Prentiss, of El Paso, will write on "Incidence and Growth of Cancer."

Dr. Crum Epler, of Pueblo, Colorado, will have a paper on "The Operation of Election in Cholecystitis."

Dr. W. Warner Watkins, of Phoenix, will have a paper on "Chronic and Subacute Appendix Disease," with lantern slides.

Among the papers so far secured from within the state, are the following:

Dr. J. D. Mulder of the Reheboth Mission will give a paper on "Trachoma."

Dr. G. H. Luckett, State Director of Public Health, will write on "The Modern Treatment of Syphilis."

Dr. R. E. McBride will write on "Some Needed Changes in Our Medical Law."

Dr. G. S. Luckett will write on "The Relation of the Practicing Physician to the Health Department."

The headquarters of the meeting will be the "El Navajo," one of the famous

Harvey houses of the Santa Fe line. Reservations should be made in advance by writing the Reception Committee, since the accommodations are always limited at the Harvey hotels.

Local committees are as follows:

Reception: Drs. H. G. Willson, A. H. DeLong and H. T. Watson, Gallup, N. M.

Arrangements: Drs. A. E. Dodson, J. W. Stofer and W. B. Cantrell.

Program: Drs. J. W. Elder, J. W. Hannett and J. W. Stofer.

The President-elect of the New Mexico Medical Society is Dr. H. A. Miller of Clovis. The retiring President is Dr. C. Russell, of Artesia. The Program Committee is composed of the President of the Entertaining Society (Dr. J. W. Hannett, of Gallup), the Secretary of the same society (Dr. J. W. Stofer, of Gallup), and the Secretary of the State Society (Dr. J. W. Elder, of Albuquerque), who is serving out the unexpired term of Dr. Tull (Secretary), who has moved to Los Angeles.

The Social Program includes the following features:

Entertainment of the visiting ladies by the Women's Club and Eastern Star.

Smoker and Boxing Contest, Friday evening, April 28.

Banquet and Dance, Saturday evening, April 29.

Trip to Inscription Rock and the Zuni Indian village on Sunday, April 30.

Dr. Stofer advises that for any visitors who will remain over Sunday, a trip to Inscription Rock,—40 miles distant,—will be arranged. This is one of the many interesting historical points in New Mexico, there being here the remains of one of the oldest of the Spanish settlements in the New World. It is perhaps hardly necessary to recall to mind that northern New Mexico contends with St. Augustine, Florida, the

right to claim the first settlement of whites on the American continent.

MEDICINE OR MEDICAL SCIENCE?

What is in a name? Much, in this day of advertising. If the world is inclined to accept the valuation which a man places on himself, the same is true, in a measure, of an organization or profession. The valuation which we have placed on our profession is reflected in our nomenclature, and if the public classes physicians and surgeons as *artizans* instead of *scientists*, we cannot blame them when we have invited them to do so.

Just to the extent that we have forgotten that *our practice* is rooted in natural science and have held aloof from the great body of general science, just to that extent has the public forgotten that we are scientists at all. When we recall that only within the last generation have we acknowledged, in our schools, that physics and chemistry are necessary foundations for medical training, we may judge how dangerously far we have strayed, and the reaction in the public mind has been *pari passu* with our own self-righteous isolation.

There has been, in the past few years, a slow but sure tendency to return to a correct conception of our normal relations in the scheme of things scientific. Two significant evidences of this are cited in a recent address of Dr. Erlanger, (Science, Feb. 10, 1922), where two large and influential organizations have made changes in nomenclature. The American Association for the Advancement of Science changed the name of its Section on Physiology and Experimental Medicine to "Section on Medical Sciences." The National Research Council, in perfecting its permanent organization, changed the name of its Medical Division to "Division of the Medical Sciences."

As a further illustration of the rapidly growing tendency to recognize the inseparable and close relation between clinical medicine and general abstract science, he has investigated the number of scientists without an "M. D." degree, who are devoting themselves to the "practice" of medicine, either as teach-

ers or as clinical or research laboratory directors. He finds the number to be about 1200 in the United States. This has no reference to "technicians," but refers to men whose standing, in the medical world is in every respect on a par with the highest type of physician or surgeon. We are entirely too prone to take the attitude that the possession of an M. D. degree endows a man with some special distinction in handling disease problems. Such a degree, even supplemented by years of practical experience, does not entitle a doctor to be called a scientist, unless he has been grounded in the fundamental sciences from which medicine has developed,—physics, chemistry, biology, etc. A striking testimonial to the value of these fundamentals in clinical practice was recently given by Joslin, when he recited the marked advance made in recent years in treating diabetes; he declared that this advance was due solely to the voluntary contributions on metabolism forced upon the medical profession by physiologists and research workers, who are not medical men. Dr. Erlanger concludes his address by saying, "the value of science in medicine is coming to be appreciated by scientific men and presages a recognition of its worth by the enlightened public at, let us hope, not too remote a date. When that has come about, and not until then, will medical science in the United States come into its own."

This "recognition by an enlightened public" is a consummation devoutly to be desired and there are evidences that it is gradually coming about. The difference in the foothold which quacks and religio-psychologic cults have secured in this country, compared with their lack of progress in foreign countries is due to our lax medical teaching and faulty attitude in the past toward general science. Had the position been taken fifty years ago, either by the Government, or by the medical profession itself, that the physician must be a *scientist first*, and a practitioner, or *practical applicant of that science*, afterwards, the public mind would have reacted to that idea, and quasi-medical theories would never have been born.

But when medical colleges were allowed to spring up like mushrooms and the country was flooded with inadequately trained "M. D." holders, the educational effect of this condition was inevitable.

We are now attempting to undo this damage, and there is evidence that some headway is being made. One notable example aimed directly at a pseudo-medical cult, is represented by the articles in Leslie's on "Chiro-quack-tic." Another one which will have its effect upon just as false a teaching, is the series of articles in the Pictorial Review on "Medical Psychology." Here the explanation of any of the authentic "cures" of the Christian Scientists are explained by the natural and well-known phenomena of psychologic reactions. The powerful effects of auto-suggestion and other subconscious mental processes on physiological charges must not be minimized by medical men. Let us affirm and re-affirm that medical practice is firmly grounded in fundamental science, and cannot be attacked without first destroying the sciences from which it has grown. If one wishes to deny the verity of chemistry, physics, mathematics, and other natural sciences, such an unfortunate can be disregarded by us, in our reconstruction work of enlightening the public to the true place of Medical Science in the world's work and future development.

LOYALTY

One of the rarest of human traits, and yet one which every man will protest to high Heaven that he possesses. This publication has received numerous solemn protestations of loyalty, and although we realize the frailty of human vows, we must build our hopes upon such assurances.

The one direction in which loyalty will be the most valuable to us, and the one in which it is conspicuously absent, is the support of the journal in our advertising pages. If a scant dozen doctors, of the hundreds who receive this publication, should make it a practice to search the advertising pages whenever they need supplies, and pat-

ronize the advertisers herein contained, letting the advertisers know that their ads are in this way, effective, this would be the most valuable contribution this journal has ever yet received.

Further, if another dozen doctors, or the same dozen, should take the pains to answer the "direct-by-mail" solicitations daily received by them, and tell such advertisers that they patronize the firms which advertise in our official journal, this alone would insure our financial success.

We repeat that loyalty to this journal, in spite of protestations to the contrary, is hardly to be found among our readers. Actions speak louder than talk. ACT NOW!

DIPHTHERIA CONTROL

The campaign against diphtheria, in New York City, which has been aggressively waged by Dr. Abraham Zingher, for the past eight years, is to be carried into other cities of that state. The cities of Auburn, Schenectady and Syracuse have been selected as the next points of attack, and the State Department of Health will have the co-operation of local health and school officials, Red Cross and other civic organizations. According to the figures analyzed by Dr. E. S. Godfrey, Director of the Division of Communicable Diseases (formerly Superintendent of Public Health in Arizona), in every city of that state, with the notable exception of New York City, there was a sharp rise in the incidence of diphtheria, beginning in 1919. New York City now has the lowest diphtheria rate it has ever experienced, and is the only city in the state whose rate is below that of the state at large. The conclusion cannot be escaped that this appreciable difference is due to the campaign carried on by the Board of Health of that city, in which more than 100,000 children have been immunized.

In view of these facts, the statements of Cumming (J. A. M. A., March 4, 1922), that the control of diphtheria

will not come through immunization, but through a continuance of the forty-year-old effort to control the sources of infection, is astonishing. With a simple and effective method like the TAT immunization, certainly we should look for our parallel in the methods so successfully applied to smallpox, rather in those ineffectually applied in the past to other communicable diseases, including diphtheria.

"DIRECT BY MAIL" LITERATURE

The gullibility of the medical profession is being tested on a gigantic scale, at the present time. Every firm which has a product to sell to the medical profession is betting on this well known trait of ours, through their "direct-by-mail" soliciting. In this type of advertising, deserving firms compete with fraudulent ones, and wise is the physician who can discriminate. There is one certain method, however, when applicable. If the firm's product is advertised in your official medical journal it is trustworthy; if it is not, it may still be trustworthy, but cannot be taken on its claims. There is always a chance that its dubious character may have barred it from these advertising columns.

In a recent tour made by a representative of the American Medical Association, he was frankly told that physicians would respond more readily to "direct-by-mail" soliciting than they would to advertisements in their own official journals. The tragedy of this is that it is usually true. A medical organization will establish its official journal, one of the chief functions of which is to censor the products advertised to the medical profession and present, in its own advertising pages, the acceptable and trustworthy products. Then, the organization will turn its back upon its own creation and respond to the flood of "junk" which every mail brings to their desks. And yet somebody once called it *Homo Sapiens!*

PERSONALS AND NEWS ITEMS

Dr. George A. Bridge, of Bisbee, chief surgeon of the Copper Queen Hospital, recently suffered a very distressing accident. While playing with his young son, he fell from a bicycle and fractured one of his femurs at its neck. We are informed that there was no displacement and an uneventful recovery is expected in due course.

At the recent election in Phoenix, Dr. W. C. Ellis, one of the active practitioners of that place, was elected to the City Commission, and will take office May 1st. The other two candidates on the same ticket were also elected, all being pledged to make a change in the city manager, which will probably mean a complete change in the city health department.

Dr. W. C. Hackett, a colored physician of Phoenix, who has been actively engaged in practice there for several years, recently purchased the old Kibbey property on East Jefferson Street, and has remodelled it into a hospital, catering particularly to his own race. Dr. Hackett has won the respect and confidence of the medical profession of the community and his venture will, no doubt, be a success. The location and the building are both well adapted for such an institution; it has been entirely refinished, and equipped with a surgery and will accommodate about twenty patients.

The Arkansas Medical Society announces their annual session at Little Rock, on May 17th, 18th and 19th. This is to be a "home-coming" meeting and the attendance of Arkansas doctors, now practicing in other states, is especially desired.

RECIPROCITY WITH THE STATE OF SONORA

The secretary of the Santa Cruz Medical Society,—Dr. A. Wallace,—advises that the negotiations with the State of Sonora, Mexico, for the acceptance of Arizona's certificates to practice medicine and surgery, have been successfully concluded. Applications should be made to the secretary of the State of Sonora, and should be accompanied by fifty pesos. This very desirable reciprocity has long been sought by the Santa Cruz Society, and probably foreshadows similar action by

other states in Mexico. It applies only to the practice of medicine, and does not include osteopathy or chiropractic.

ARIZONA HOSPITAL AND SANATORIUM

In the reorganization of the old Arizona Hospital, the Tucson-Arizona Sanatorium building has been renovated and equipped for complete modern medical and surgical service, as well as for sanatorium patients. The former Arizona Hospital building at 123 S. Stone avenue, has been made into a Physicians' Building, occupied exclusively by physicians and dentists.

ST. JOSEPH'S HOSPITAL STAFF MEETING

(Phoenix)

The meeting of St. Joseph's Hospital Staff, held on March 9th, saw the inauguration of their clinical discussions, one of the main requirements of a standard hospital. The clinical records of four cases were on the program, only two of which were presented. Dr. Yandell presented the history and description of treatment of a case of injury to the face, which fractured the antrum, displaced an unerupted tooth, and was followed by infection of the antrum, suppuration and persistent discharge from an infraorbital sinus. It elicited a spirited discussion, ranging over the failure of the x-ray department to show the fracture, the failure of the surgeon to find the supposed loose tooth, the ineffectiveness of the treatment of the infection, the apparent prompt effect of electrified air upon the infection, and the proper methods of handling the present condition.

Dr. Schwartz presented a description of an interesting case of gunshot injury to the head and eye, in which two buckshots were shown by x-ray to be deeply imbedded in the brain substance of the frontal lobe, without any objective symptoms referable to the nervous system. This brought forth a long list of wierd injuries usually thought to be impossible without killing the patient, in all of which the victims had recovered without visible untoward effects.

Future meetings of this type will be looked forward to with great interest by all those who were present, and it is expected their inauguration will arouse renewed interest in the staff meetings.

TEXAS STATE MEDICAL ASSOCIATION

Physicians and surgeons of the Southwest and their wives and daughters who visit El Paso May 8 to 11, to attend the coming annual convention of the Texas State Medical Association, will receive a cordial welcome from this city of unique location, historic interest and modern appointments, which has set a remarkable pace in growth during the past forty years, being today the metropolis of a region stretching through three American states and the northern half of the Mexican republic. El Paso's medical fraternity, centered in the El Paso County Medical Society and backed by the Convention Bureau of the El Paso Chamber of Commerce, are looking forward enthusiastically for the arrival of every member of the profession in Texas, New Mexico, Arizona and a large attendance from Mexico. Opening on May 8 and having interesting sessions daily till the 11th, the convention will be the largest El Paso meeting of the year. Set for a season very pleasant for travel and seeing the sights, it is expected that there will be nothing lacking in comforts and pleasures for every delegate.

Southwestern doctors will have here a rare opportunity to see the sights of the "Gateway City," nestling in the sunny pass under the brow of Mount Franklin, at the point where the Castilian conquerors under Captain Oñate first trod on what is now American soil three and a quarter centuries ago, through which natural entrance the human tides of generations have ebbed and flowed, as the aboriginal tribesmen were pushed back and the outposts of civilization thrown forward. It will be a marvel to the visitor to behold an up-to-date American city which has risen since Americans took hold after the Mexican war and brought to a high standard since the seven railroads crossed here in their great work of serving the border country. Facilities are not lacking for entertaining extraordinary crowds. Electric cars, automobiles, and even the antique Mexican "coches," offer quick transportation

around city and suburbs, Fort Bliss and Ciudad Juárez.

El Paso's hotels, apartments and restaurants offer the facilities of the best American cities. Amusements in great variety are easily reached. Fifteen parks and glorietas provide shady, restful spots. Club houses and secret society buildings are numerous and commodious. El Paso Country Club, for instance, offers an all-year golf course.

Convention headquarters will be at the Paso del Norte Hotel, with the big auditorium in Liberty Hall, in El Paso's million dollar county building, ready to take care of 4,000 persons. Handsome apartments will be set aside in the court rooms of the edifice for departmental and clinical meetings and the exhibits.

Allied with El Paso's medical men in the convention arrangements are the representatives of the United States Public Health Service, United States Army Medical Corps, Federal Board for Vocational Training and the Veterans' Bureau. A complete general committee formed by the local medical society, the pioneer doctors' association in the Southwest, has anticipated the needs of the coming convention and has made elaborate plans for reception and entertainment. Dinner meetings, special affairs for the ladies and other diversions are being scheduled. The historical missions and chapels erected by the indefatigable Franciscans 300 years ago will be pointed out. Motor tours over the Scenic Drive around Mount Franklin, up and down the great irrigated valley of the Rio Grande, to Fort Bliss, largest military post on the border, and inspections of the sanatoria and hospitals of the city will be on the program.

From a climatic standpoint El Paso has points to present to medical men that are worth considering. Three hundred and thirty days a year are sunny days here, with a medium mountain altitude of 3762 feet above sea level. Absence of humidity, light rainfall, open winters and a "sensible temperature" of 22 to 28 less than the thermometric reading in summer are bringing favorable attention to this health center from doctors and patients all over America.

Among El Paso's sanatoria and hospitals, deserving of a visit, are the great William Beaumont General Hospital of the United States Army at Fort Bliss; the Southern Baptist Sanatorium for treatment of tuberculosis; the Hendricks-Laws, Homan, Long, Sunnycrest, El Paso, Wiley, Finn, Mountair, Ashworth and others, all doing their good part to restore the broken health of those who come to the sunny Southwest from less favored regions.

Convention visitors will find that a large percentage of El Paso's citizens came here seeking health, for themselves or families, got well, remained well and have prospered with the up-building of the city. Facts and figures demonstrating that El Paso is the climatic metropolis of a region greater than all the United States east of the Mississippi river will be given to every member of the Southwestern society this month. A study of the records of

the United States Weather Bureau shows that El Paso has no superior in this country in the climatic essentials for the restoration of lost health.

In hospitals, El Paso has the Hotel Dieu, conducted by the Sisters of Charity of St. Vincent de Paul; the El Paso County Hospital, managed by an efficient board; Providence Hospital, with a staff of established men; the Masonic Hospital, just reorganized to operate the property formerly known as the Rolston Hospital, and the Public Clinic, in the county building. All these have the co-operation of the medical fraternity.

Convention visitors will witness El Paso's great industries, its educational, religious and social institutions. Texas College of Mines and Metallurgy, a modern High School and Junior College, eighteen grammar schools, fifteen academies, colleges and private schools, fifty churches, nearly 100 clubs and lodges and societies are prime factors in advanced community life.

El Paso opens its gates wide for the physicians and surgeons of its own Great Southwest and bids them come and join in what will be the biggest and most enjoyable gathering of the fraternity ever scheduled for the Pass City, the logical meeting place for people of the East and West, on the silvery Rio Grande, surrounded by two republics and enlivened by the traditional hospitality of an optimistic people.



Fig. 1. El Paso del Norte Hotel. Headquarters of the Texas State Medical Association Meeting, May 9-10-11.



Fig. 2. Hotel Sheldon on right; Mills Building on left. City Plaza in center.



Fig. 3. "Liberty Hall"—El Paso County Court House, where all sections of the Association will meet. Liberty Hall in this building will seat 4,000. Other rooms will house the exhibits and sections.



Fig. 4. Looking down upon El Paso from Scenic Drive



Fig. 7. View of El Paso from the High School Building eminence.



Fig. 5. Looking toward Liberty Hall from the headquarters hotel.



Fig. 8. Old Mission Church in Juarez, Mexico; 300 years old.



Fig. 6. View from Union Depot. Tall building in distance is the Paso del Norte Hotel,—the headquarters.

EL PASO COUNTY MEDICAL SOCIETY

The El Paso County Medical Society met in regular session on March 6, 1922, with 33 members and visitors present.

Dr. Paul Gallagher reported a case of an infant delivered three weeks previous, who had two well defined scrota which resembled enlarged labia; in each of them a gland could be felt, which were taken to be testicles because it was thought an epididymis could be differentiated on each. Between the scrota was a rudimentary vagina covered with an imperforate membrane, and there was also a well defined penis. The anus was imperforate. An incision was made at the usual anal site and the rectal end of the gut was found three-quarters of an inch from the skin. This was brought down and sutured to the skin with silk worm sutures. Two weeks and three days had elapsed since the operation and the bowels have been moving regularly. Dr. Gallagher interprets the sex as male.

Dr. J. W. Cathcart reported a case of a woman who, three years before, had submitted to breast amputation because of carcinoma. There has been a recurrence in the opposite breast and a very large number of tumors have appeared under the skin over all parts of the body. Dr. Cathcart reports this case because it is the only one ever seen by him in which metastases have occurred in the skin in such large numbers after carcinoma of the breast.

Dr. R. L. Ramey demonstrated a specimen of a fibroid of the uterus complicated by pus tubes and a large polypus. The patient, a negress age 42, first noticed the tumor about two years previous. During this time the menstrual flow has been very profuse and one or two periods were missed early in the year. At the time of examination the cervix was found to be large, soft and patulous. Ballottement could be obtained and pregnancy was suspected. However, this was found to be caused by the polypus and because fibroid tumors could be felt on the body of the enlarged uterus, together with the history, operation was advised. Partial hysterectomy was done and the whole mass removed without rupture of the enlarged pus-filled tubes.

Dr. E. C. Prentiss read a paper, "Bacterial Growth in the Intestinal Tract. Biological Notes."

Capt. R. S. Loving of the William Beaumont Hospital, Ft. Bliss, demonstrated and explained a pressure pneumothorax apparatus made by him during an emergency while stationed at Ft. Bayard, New Mexico, in 1919. The apparatus contains two manometers, one of mercury to measure the air pressure and the other of water to measure the pressure in the chest cavity. It also contains filters and a solution container to filter and sterilize the air. The apparatus was a simple, practical affair and was said by other medical officers present to eliminate some of the objectionable features present in pneumothorax apparatus now on the market, and Capt. Loving was the recipient of considerable commendation. He

estimated the cost of manufacture of a similar apparatus at \$5.00. A model has been turned over to the Surgeon General for comment.

The membership of Dr. H. F. Gammons was transferred from the Dallas County Medical Society.

THE ST. LOUIS MEETING OF THE
AMERICAN MEDICAL ASSOCIATION

The arrangements of the St. Louis profession for the meeting places for the Session of the A. M. A., which is to be held in their city May 22-26 next, are singularly fortunate and convenient.

The Registration office, Post Office and Commercial Exhibit is to be in the Moolah Temple (Shrine), a beautiful and commodious building on Lindell Boulevard, two blocks west of Grand Avenue. At the other extremity of the group is the Odeon, the home of the St. Louis Symphony Orchestra, with a main hall which seats better than 2,000, and several lesser halls. The main hall will be used for the opening session. Its acoustics are particularly good and suited to our purpose. The Sections on Practice of Medicine and of Diseases of Children meet here. In the assembly hall of the same building the Sections on Pharmacology and Therapeutics, and on Pathology and Physiology will meet. (It will be noted that there has been an aim to foreground closely allied sections.) The Sheldon Memorial, a very beautiful new hall on Washington Avenue one-half block west of Grand Avenue, which most admirably meets all requirements, will be the meeting place of the Sections on Ophthalmology, and Laryngology, Otology and Rhinology. The Section on Surgery, General and Abdominal, and on Obstetrics, Gynecology and Abdominal Surgery, will be held in the Third Baptist Church on Grand Avenue, a situation well suited to the demands. The Sections on Orthopedics and Nervous and Mental diseases will meet in the Law School of the St. Louis University, on Lindell Ave., a few steps west of Grand. The hall easily seats 500 and is both comfortable and convenient. Dermatology and Syphilis and Urology will use the large Union Methodist Church, on Delmar Avenue just west of Grand, which meets every requirement. The Sections on Gastro-Enterology, Proctology and on Preventive Medicine will use the large hall in the Musicians Club on Pine Street, east of Grand Ave., and next to the building of the St. Louis Medical Society, where the House of Delegates will hold its sessions. The Section on Stomatology is assigned to the assembly hall of St. Peters Parish House, one block west of Grand on Lindell. Immediately in this district will be found three of St. Louis's most important clubs, the St. Louis University, and the Columbian. Restaurant catering to every grade of patronage are numerous in the district and precautions have been taken to insure that normal rates continue during the meeting.

The St. Louis profession is preparing for an unusual attendance; hotel reservations are coming in rapidly but it is purposed that even the late comer shall be comfortably housed. The wise traveler, however, makes his reservation as early as he finds it possible. Dr. M. B. Clopton, 3525 Pine St., St. Louis, is Chairman of the Committee on Sections and Section Work.

ABSTRACTS FROM THE CURRENT LITERATURE

POISONOUS ANIMALS OF THE DESERT: Chas. T. Vorhies, Ph. D., Zoologist, Tucson, Arizona.

This pamphlet, distributed by the Agricultural Experiment Station of the University of Arizona, is very interesting and instructive. Nineteen species of rattlesnakes are known, fourteen occur in the United States, and of these fourteen, eleven are found in Arizona. Only one variety of the pygmy rattlesnakes is known to occur in Arizona (Edward's Masasauga), found in southeastern Arizona. Of the larger species, the following occur: Western Diamond Rattlesnake, the most common form in desert valleys; Black Tailed Rattlesnake, common in extreme southern Arizona; White Rattlesnake, in southwestern portion; Price's Rattlesnake, rare in the mountains of southern Arizona; Green Rattlesnake, small snake along the southern border; Tiger Rattlesnake, southwestern Arizona; Horned Rattlesnake, or side-winder; Pacific Rattlesnake, also called Black Rattlesnake, very rare in Arizona; Prairie Rattlesnake, one specimen reported in Arizona.

All rattlesnakes are dangerous and deadly, but there is no need to be panic stricken at sight of one; they cannot strike accurately more than half their length, and absolutely cannot leap at its victim.

The writer emphasizes the fact, now recognized by all informed medical men, that whiskey is *not a remedy for snake venom*, and the best way to finish the job started by the rattler is to administer plenty of alcoholic depressant. The ordinary recognized procedures of a tourniquet, incision of the bites, and potassium permanganate are given as the treatment.

Aside from the rattler only two other poisonous snakes are found in Arizona; these are the Annulated Snake found in the southern part of the state, which is not very dangerous, and the Sonoran Coral Snake, which is dangerous if provoked, and *chews* to imbed the fangs.

All the other snakes are useful animals and should be protected and encouraged to multiply on account of their tendency to destroy rodents. Many European countries have protective legislation for snakes.

Only one other poisonous reptile is found in Arizona,—and that is the Gila Monster; this and a closely allied species found only in Mexico, are the only poisonous lizards in the world. The Gila Monster has poison glands, but no poison fangs, the secretion oozing out between the lips and teeth. It bites only when

irritated and then holds on like a bulldog, usually more harm being done in the attempts to dislodge the lizard than his bite will produce. The venom is not to be regarded as deadly to man. If bitten, the part should be released as carefully and rapidly as possible, bleeding induced and the wound washed with an antiseptic. Swelling and hemorrhagic discoloration will result. The Banded Gecko, a delicate, retiring and absolutely harmless lizard, is often mistaken for a "young Gila Monster," but is entirely different.

Some space is devoted to a discussion of the skunks, on account of their relation to hydrophobia.

Among the *Anthropoda*, several species are described and several common superstitions refuted, concerning these "animals."

He first calls attention to the observation that very few of even the most dreaded insects of the desert country can inflict a more dangerous or painful wound than the common honey bee, or the wasp. Many of the ants of the Southwest have stings, but they all attack by biting and then spray the wound thus made with poison from the sting. Among the most formidable of the stinging ants are the "harvester ants," whose sting is severe and produces a fiery, numbing pain which may last for hours.

The insect known to entomologists as "cone noses" are poisonous, also known as the "Arizona bedbug," bellows bug" and "Arizona tiger." They have a cone-shaped beak with which they stab quickly and viciously.

Two innocent and non-poisonous insects found in the Southwest, which are feared without cause, are the "sand cricket" or "Child-of-the-Desert," and the one known by the Mexicans as the "campamocha" or Praying Mantis." This latter, especially, is a useful insect and perfectly harmless.

The flannel moth or "woolly caterpillar" have, hidden among their long and soft, harmless hairs, many stiff bristles or spine-like hairs, which will penetrate the skin and break off, producing a rash like that caused by nettle.

SPIDERS: Tarantulas are among the most dreaded of all spiders by the average person. They have poison jaws for killing their prey. They are not nearly so likely to bite a human being as is generally supposed, but their bite is likely to be severe, if not serious, but should not be considered dangerous to the life of the average, healthy adult.

A small black spider, commonly known as the "Black widow" or "shoe button spider" is more poisonous than the tarantula, but not nearly so common in Arizona.

The Mata Venado or "vinegarone," is represented by five species in Arizona. These insects do not have poison glands, and although they have a fearful reputation, especially among Mexicans, this is not borne out by verified facts.

SCORPIONS: These insects do not bite, but sting by throwing the so-called tail up and forward and striking with it. There is a well-developed poison gland in the bulbous base of

the sting. The writer emphasizes that the results from the sting of any Arizona scorpion are no more likely to be fatal than are the stings of the honey bee. The Whip Scorpion or "grampus," is even more feared than the ordinary scorpion, yet it has no sting and is non-poisonous.

CENTIPEDES: The front pair of legs is laid forward beneath the head, where they act as a pair of jaws moving laterally, and within their bases lie the poison glands. The posterior pair are held elevated and are often mistaken for antennae. These insects inflict bites which are very painful and relatively serious, but there is little ground for the unreasoning fear of centipedes, as compared with the relative calmness about bees. The frequent statement about the poisonous character of all the feet is groundless. They have no poison glands, but they have sharp-pointed claws and may cling sufficiently to produce puncture wounds.

ARTIFICIAL PNEUMOTHORAX IN LUNG ABSCESS, HEMATOTHORAX, BRONCHIECTASIS, AND IN ADVANCED PULMONARY TUBERCULOSIS: *Clendenin*, Southwest Jour. M. & S., February, 1921.

After trying out all the complicated methods, he now uses plain air, simply washing it through sterile water. His indications in tuberculosis are advanced cases, confined to one side, without pleural adhesions, introducing from 500 to 1000 c. c. at the first injection, and after securing collapse, maintaining this for at least a year. Among other hemorrhage conditions, he advises its use in gunshot wounds of the lung. In acute lung abscess, bronchiectasis and pleural effusion, pneumothorax is recommended.

NEUROSYPHILIS: The Public Health Service has recently sent out an inquiry to a few of the leading syphilographers of this country asking for an expression of opinion on the frequency and treatment of neurosyphilis. The general opinion of the men written to was expressed as follows:

"While a certain amount of the apparent increase of neurosyphilis is due to the increasing use of spinal fluid examinations and other modern diagnostic methods, I think there is no question that the ineffective use of arsenicals plays a very important part in this most undesirable tendency,—the physician or health officer who is unable or unwilling to follow a syphilitic patient through a period of years, if not for life should not attempt to treat the disease. Relapse is certainly the great outstanding fact of syphilis and the so-called modern treatment has certainly not entirely done away with it. In particular, relapse in the nervous system and infectious involvement of the mucous membranes and genitalia are so alarmingly frequent under the inadequate use of arsphenamine that every agency which employs this drug in the treatment of syphilis should be thoroughly on the alert and equipped to detect the earliest manifestations of relapse."—*Stokes*.

"It appears to us that among the factors mentioned as probable causes, two are of

paramount importance, viz.: (1) the tendency to undertreat; (2) the failure to interpret pathologic findings in the light of the clinical picture. (Fraser and Duncan, *British Journal of Dermatology and Syphilis*, July, August and September, 1921). To these we would add another of almost equal importance,—the tendency to interrupt treatment by periods of rest. To our minds the treatment of all syphilis ought logically to be continuous rather than intermittent. Early neurosyphilis in the form of neurorecurrences would be reduced to nil if this were done. Late clinical neurosyphilis might be equally easily avoided by the early routine use of spinal puncture and by adjustment of treatment to the pathological findings. We agree that the 'sterilization' treatment of syphilis, as exemplified by Pollitzer's method, is distinctly dangerous from the point of view of neurosyphilis, and that treatment should be directed toward building up the patient's own resistance to the disease. Stokes' discussion of this problem in his paper, 'The Application and Limitation of the Arsphenamine in Therapeutics' (*Archives of Dermatology and Syphilology*, September, 1920.—See *Venereal Disease Division Abstracts*, March, 1921) deserves wider circulation than it has as yet obtained. The most crying present need of syphilotherapy is a standard treatment, sufficiently elastic to be adapted to all types of cases, and sufficiently simple to be used by the average physician,—unless a physician feels himself competent to carry out all the necessary procedures in the treatment of any given case, he should not attempt to treat it at all. Though many cases can be successfully dealt with by the general practitioner, he should realize that the appearance of any complicating features is sufficient to warrant the transfer of the patient to a competent syphilologist."—*Keidel and Moore*.

"Syphilis of the nervous system probably begins in the first year of the infection. The number of cases corresponds roughly with the total number of cases of so-called late neurosyphilis. These statements are based on the following observations:

"(a) The number of early cases showing positive findings in the spinal fluid; (b) familial types of neurosyphilis; (c) biologic evidence of a neurotropic strain of the treponema; (d) persistence of the infection in loco, as in aortitis, interstitial keratitis, etc.; (e) observation of patients who developed signs of early syphilis of the nervous system and who after years died of paresis or other late degenerations; (f) no serologic evidence as yet exists showing normal spinal fluid in the early stage and its infection at a later period.

"Early neurosyphilis may manifest itself by obtrusive symptoms, by slight objective signs or be asymptomatic. Unless they are properly and thoroughly treated these early infections may persist and cause late neurosyphilis.

"Every case of early syphilis should be treated intensively with arsphenamine and mercury given systematically in courses consisting of not less than eight injections of

arsphenamine or its equivalent, nearsphenamine or silver arsphenamine or its equivalent, and fifteen injections of mercury; a minimum of two courses of the former and three of the latter should be administered. The treatment should be controlled by frequent Wassermann tests and a lumbar puncture made about six months after infection or earlier if indications should exist. Complete neurological examination should be made in order to detect early involvement of the nervous system and as a control for future examinations.

"The treatment outlined is not an insurance against the occurrence of neurosyphilis, which not infrequently takes place during the active administration of the drugs. In such cases intraspinal medication administered by one familiar with the proper technic may be a necessary adjunct. It is only by controlling early neurosyphilis that we can hope to prevent the later degenerations."—*John A. Fordyce.*

TUBERCULOSIS AND SYPHILIS OF THE LUNGS: *Carter, Va. Med. Monthly, January, 1922, p. 553.*

This author reviews the literature and submits the evidence which he has collected from the cases coming under his observation. He reports nine cases in detail. In these the diagnosis rested on the therapeutic tests. He finds that patients with tuberculosis, complicated by syphilis, will take arsphenamine and mercury, if the disease has not reached an advanced stage. (Note.—This observation is contrary to that of many other workers in tuberculosis, most of whom are fearful of the arsenicals in these cases.—*W. W. W.*)

TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM: *Smith, Va. Med. Monthly, January, 1922, p. 561.*

Syphilis invades the nervous system very early after the infection occurs. General treatment usually prevents the late manifestations of syphilis of the nervous system. When the late manifestations develop, a combination of general and direct treatment is recommended. The general treatment is with arsphenamine, mercury and iodides, according to a schedule given. The direct treatment is by the intraspinal injection of arsphenaminized serum, using from .4 to .8 mgm. per injection, at two or three-week intervals.

ADENOMA OF THE PITUITARY: *Hunter, Va. Med. Monthly January, 1922, p. 563.*

Five cases of adenoma of the pituitary are reported, with roentgenograms, visual fields and clinical histories. All were operated by *W. E. Dandy*, with three deaths and two recoveries.

Diagnosis in these cases rested on clinical symptoms of failing vision or bitemporal hemianopsia, with the x-ray findings of enlargement of the sella turcica. Patients usually consult the oculist first, on account of failing vision.

TUBERCULOSIS OF THE KIDNEY: *Dodson, Va. Med. Monthly, January, 1922, p. 574.*

This is an excellent article with several

good illustrations of pathology. The diagnosis of tuberculosis of the kidney is dependent upon a carefully taken history and physical examination, and the intelligent use of the cystoscope, microscope and x-ray.

Pus cells in the absence of pyogenic organisms points strongly to tuberculosis. Very frequently the diagnosis can be made from the cystoscopic appearance of the ureteral orifices, without invading the ureters. Catheterization of the normal ureter should be avoided, if possible.

The x-ray evidence of kidney tuberculosis consists in detecting the deposit of lime salts in caseating areas. When pyelography is used the signs are irregular contraction of the pelvis with cortical involvement, or when the pelvis is invaded, by unevenness in the pelvic outline, or dilated calyces with ragged borders. With communicating cortical lesions, the opaque fluid will show detached shadows or shadows with a narrow communicating line. At the Mayo Clinic, about one case in five showed abnormalities to the x-ray examination.

FOCAL INFECTION OF THE GENITO URINARY TRACT: *Price, Va. Med. Monthly, January, 1922, p. 582.*

Foci of infection in the urinary tract are, at times, associated with constitutional conditions. The writer's experience has proven that the following conditions do sometimes cause the development of metastatic lesions: Balanitis, balanoposthitis, prostatitis, stricture of the ureter, pyelitis, chronic gonorrhea, vesiculitis, verumontanumitis, pyelonephritis and hematogenous infection of the kidneys.

URETERAL CALCULI: *Livermore, Jour. Tenn. State Med. Assn., January, 1922, p. 332.*

A calculus which has passed into the ureter can, in the majority of cases, be made to pass on into the bladder. *Crowell* says that he has accomplished this in 98% of his cases. *Livermore* has devised an instrument which can be passed up the ureter, like a *Walther* dilator, by means of which the stone can be grasped and traction made on it.

DEVICE TO FACILITATE HANDLING OF PATIENTS IN WHITMAN ABDUCTION SPLINT: *Schussler, Minn. Med., February, 1922, p. 114.*

There is described a method of handling patient with fractured hip, easily and without discomfort. This is done with a large canvas belt and pulley arrangement attached to the horizontal cross beam of the Balkan frame. One nurse can raise and lower the patient, turn him over or move him from side to side of the bed, without discomfort to the patient or great effort on the part of the nurse. The article is illustrated with several cuts showing the construction of the simple mechanism.

CIRCULATORY DISTURBANCES OF THE FEET: *Geist, Minn. Med., February, 1922, p. 98.*

There is discussed the symptoms and classification of the arterial disorders of the feet. The etiology includes tobacco, alcohol, coffee, syphilis, diabetes, cold. The symptoms are pain, tenderness, swelling, coldness, numbness

and other sensory disturbances. The most important objective symptom is the absence of the dorsalis pedis pulse. He classifies the lesions into (1) congenitally small arteries; (2) arterial spasm; (3) arteriosclerosis; (4) thromboangitis obliterans.

INTESTINAL POLYPOSIS AND ITS RELATION TO CARCINOMA: *Warwick*, Minn. Med., February, 1922, p. 94.

This author records the finding of two cases of intestinal polyposis, both discovered at necropsy. She suggests that these tumors be watched for and data be gathered regarding them, since they are perhaps more frequent than is supposed and because of their potential danger in developing into carcinomas.

MITRAL STENOSIS: *Tuohy*, *Journal-Lancet*, Jan. 15, 1922, p. 23.

This very interesting paper concerning what Mackenzie says "is the most common valvular defect with which heart failure is associated," calls attention to the fact that mitral stenosis begins as something else and very frequently is found unexpectedly in patients who have been under careful observation for a long period of time. This simply means that the stenosis is secondary to some other cause and develops to the point where it can be detected. Certain end results usually are found and these should always lead to further inquiry into the heart condition. These complexes are:

(1) Gastro-intestinal symptoms; about one-third of the patients come complaining of these presenting symptoms, which are due to passive congestion.

(2) Hemoptysis occurs in 9% of the cases.

(3) Cough, dyspnea and bronchitis occur in 72%.

(4) Infarction and emboli; these accidents may be the first evidence of the real underlying condition.

(5) Chest pain occurs in 2%.

The physical findings and the importance of fibrillation both as regards diagnosis and prognosis, are discussed.

THE DUODENAL TUBE IN THE STUDY OF LIVER AND PANCREATIC PATHOLOGY: *Dowden and Enfield*, *Sou. Med. Jour.*, February, 1922, p. 103.

These workers believed that a comprehensive study on a comparatively few patients would be better than incomplete statistics from work on a large number. Therefore, they selected 100 patients, presenting various conditions, or healthy, and made the following observations:

(1) Clinical history; (2) thorough physical examination; (3) x-ray examination on 55 of the cases; (4) careful microscopic and cultural study of the biliary secretion; (5) estimation of the pancreatic ferments in the duodenal contents; (6) functional tests of the liver by study of the phenoltetrachlorophthalein in the recovered bile; (7) hemoclastic crisis of Widal and urobilin in the urine; (8) gastric, fecal and urine

analyses and Wassermann tests; (9) blood chemistry and basal metabolism in many cases.

The investigators did not find sufficient uniformity in these tests or diagnostic procedures to warrant the acceptance of any one of them as conclusive of pathology, although they believe there is great promise in the future, after the methods have been thoroughly correlated with carefully taken histories and physical findings on a large number of patients.

OSTEITIS DEFORMANS (PAGET'S DISEASE): *Lewin*, *Jour. of Bone and Joint Surg.*, January, 1922, p. 45.

The author gives a very thorough historical review of this rather infrequent but interesting condition, and reports three cases observed in Cook County Hospital (Chicago). The total number of cases so far reported in literature is 251. The essential pathology is an osteoporosis in the early stages, during which period occur the many bony deformities which call attention to the disease. In the later stages, the osteosclerosis occurs, the cortex of the bone becoming very hard. The article is very complete and will make a good reference for future use.

CHRONIC OSTEOMYELITIS SECONDARY TO COMPOUND FRACTURE: *McBane*, *Jour. of Bone and Joint Surg.*, January 1922, p. 67.

Of 359 cases of chronic osteomyelitis following compound fractures, 10% were still ununited after two years. Chronic osteomyelitis of spongy bones is more difficult to heal than those in the shafts of long bones. Osteomyelitis of the femur is the most difficult to cure. Careful effacements and partial closure give the best results.

FRACTURE OF THE SPINE: *Kleinberg*, *Jour. of Bone and Joint Surg.*, January, 1922, p. 80.

This is a fairly comprehensive presentation of the symptoms, prognosis and treatment of spine fractures, with several well illustrated case reports. The symptoms which suggest fracture of the spine are: (1) history of injury; (2) localized and persistent pain in the spine, with weakness of back, referred or nerve root pains and cord symptoms; (3) localized tenderness, deformity and limited mobility; (4) x-ray findings. Under treatment, among other things, the author discusses the advisability of immediate laminectomy in fractures with cord symptoms. He rather inclines toward the opinion that, on the whole, a few days of observation of the effects of rest and efficient support, offers the better prognosis, than immediate laminectomy on all cases.

BLOOD TRANSFUSION IN OBSTETRICS: *King*, *New Orleans Med. & Surg. Jour.*, February, 1922, p. 549.

This author has employed transfusion by the citrate method, in obstetrical cases complicated by hemorrhage, puerperal infection, pernicious vomiting, and in hemorrhagic disease of the newborn. He claims that, in addition to the usual grouping by the Moss method, the patient's blood and the donor's blood should be

(Continued on page 174)



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(Continued from page 172)

tested against each other. (This point was further emphasized by Dr. Parham, in the discussion). In transfusion for puerperal septicemia, the author quotes Polak, whose practice is to give small transfusions (250 to 300 cc), at frequent intervals, rather than one large dose. In hemorrhagic disease of the newborn, the anterior fontanelle route is used, no difficulty being experienced, care being taken to be sure that the needle has not passed through the sinus and dura.

ACUTE INTESTINAL OBSTRUCTION CAUSED BY MECKEL'S DIVERTICULUM: *Grizzard, Jour. of the Tenn. Med. Assn., January, 1922, p. 335.*

Intestinal obstruction due to Meckel's diverticulum may be caused in several ways:

(1) Volvulus by rotation of the ileum about its mesenteric border caused by lever action of a distended diverticulum.

(2) Intussusception from invagination of an inverted diverticulum.

(3) The commonest form is through the diverticulum taking the form of a band, causing strangulation of the bowel loops caught between it and its attachment to the intestine.

The author reports a case caused by strangulation of the small bowel over a bridge formed by the diverticulum which extended from the umbilicus to a point on the ileum about 18 inches from the ileocecal valve.

PROPAGANDA FOR REFORM

UROTROPIN was removed from the list of articles accepted for New and Non-official Remedies because Schering and Glatz, Inc., refused to place the U. S. Pharmacopeia name hexamethylenamine (hexamethylenamina) on the label and in its advertising so as to make clear to physicians the identity of the product, and because it was sold under therapeutic claims which the Council held unwarranted. An advertising pamphlet sent to physicians in 1921 contains a number of unwarranted statements; particularly objectionable are the claims made for the use of Urotropin as an antiseptic in body fluids that are alkaline, such as the cerebro-spinal fluid, bile, aqueous humor of the eye, saliva, the excretions caused by middle ear infection and other excretions of the nasal, bronchial, laryngeal and mucous membranes. The lack of efficacy of hexamethylenamine in alkaline secretions is generally admitted, and the clinical references to the use of hexamethylenamine in the pamphlet are obsolete. In the introduction to the pamphlet, Schering and Galtz state that they are well acquainted with the scientific research work discrediting the efficiency of hexamethylenamine in non-acid media, but that they feel that the accumulated evidence for its efficacy in such conditions should not be "brushed aside." However, the pamphlet is not made up of quotations, but of unqualified statements. With one exception, all reference to the antiseptic properties of the drug in alkaline media are previous to 1913; that is, before the importance of reaction of the medium was fully appreciated. To quote these

earlier articles, without regard to the later work which in most eyes discredited them, constitutes in effect an exploitation of this brand of hexamethylenamine under unwarranted therapeutic claims. (*oJur. A. M. A.* Feb. 18, 1922, p. 531).

BIO-CHEMIC LABORATORIES' PRODUCTS.—The Bio-Chemic Laboratories, Chicago and Los Angeles, send out the following advertising: (1) "Salvarsan and Mercury without the Needle." In this pamphlet the use of Salvarsan and Merc-Absorbs, preparations for the rectal administration of arsphenamine and mercury, respectively. (2) "Something New in Glandular Therapy—Caplets." This circular declares that "Caplets make possible the preparation of any pluriglandular combinations in your office. Your office girl can make them up for you." (3) "Why Gland Transplantation?" A circular devoted to "Orch-Absorbs" which is said to be "a preparation of interstitial glands for intra-rectal administration." No preparation of the Bio-Chemic Laboratories has been accepted for New and Non-official Remedies. The Council on Pharmacy and Chemistry, however, has published a report on another proprietary form of administering arsphenamine by rectum. This brings out the lack of evidence for the efficacy of this method of arsphenamine administration. The pluriglandular "Caplet" medication is a form of shot-gun therapy that has been the subject of a report of the Council on Pharmacy and Chemistry and has been discussed editorially. (*Jour. A. M. A.*, Feb. 25, 1922, p. 603).

EFFECTIVE IODINE THERAPY

A striking innovation in iodine therapy has been the introduction of compounds of iodine with proteins. The advocates of these organic combinations assert that they are less irritating to the digestive tract and less inclined to set up the disagreeable symptoms of iodism—such symptoms, for instance, as coryza and skin eruptions.

Iodalbin is one of the later iodine compounds intended for internal use. It is a compound of iodine and blood albumin, containing approximately 21.5 per cent. of iodine. When administered by the mouth, Iodalbin suffers little change in the acid contents of the stomach, but on passing into the intestine it is dissolved by contact with the alkaline secretions and on absorption exerts a physiologic action similar to that of the soluble iodides. One great advantage possessed by Iodalbin is the fact that it is insoluble in the acid gastric contents. There is consequently less possibility of the distressing symptoms which so frequently follow the soluble iodides. Its blandness makes it acceptable to sensitive patients, and it is especially gratifying to those who object to the taste and nauseating effect of sodium or potassium iodide.

Iodalbin is manufactured by Parke, Davis & Company, whose advertisement appears elsewhere in this issue, and who offer to send descriptive literature to inquiring physicians.

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THE RELATION OF CHEMICAL RESEARCH TO MEDICINE*

DR. H. A. MILLER, Clovis, N. M.

Chemistry is the fundamental science of the transformation of matter; this science is searching, seeking and classifying the ultimate construction of matter. Physics deals with the transformation of energy, the molecule in which the identity of matter is retained, but chemistry delves deeper and separates the molecule into its component atoms and, further, finds the arrangement of these atoms in the molecule.

During the recent war, when it became clear that poison gas was to constitute a powerful offense and defense, research chemists of America were called upon to solve problems of production and effectiveness which would give our forces an ample supply. These men, instead of working singly in isolated laboratories, were assembled at the American University Experiment Station, in Washington, where they could be in close conference. They were aided or supplemented by a group of pharmacologists and pathologists, who worked in close association with these chemists. Through the efforts of this group, we all know how rapidly this phase of warfare was solved and America, at the cessation of hostilities, had probably progressed far beyond any of the other countries in production and effectiveness of this weapon.

From this success in making war future medicine should learn a lesson

in battling against disease. Could not the same co-operative and associated methods used so successfully in solving problems of war, be used likewise to solve problems of peace? While war claims many victims, disease claims more. Victims of cancer, tuberculosis, pneumonia, influenza and the crippled from epilepsy, insanity, malnutrition, abnormal development and many other diseases, still continue. These ravages of disease keep on, despite the fact that almost daily we are refining our technique in diagnostic and laboratory methods. That our present armamentarium of treatment is still inadequate is attested by the fact that the drug bill of this country annually is about five hundred million dollars of which amount about three hundred million dollars is spent for so-called "patent medicines." Many new medicaments are being offered for treatment, without due research being made as to their worth. Drug items on the market are legion and many cults of healing have sprung up. Thus the frailties and suffering of humanity are being exploited.

Centuries ago, the physician and the chemist worked together for the alleviation of suffering, the chief aim of the chemist being the furnishing of medicines for the use of physicians. They separated, however, due perhaps to the fact that the physician could not collect sufficient fees to remunerate his co-

*Address of the President, Fortieth Annual Session of the New Mexico Medical Society, at Gallup, April 28th and 29th, 1922.

worker; the physician turned to other means to obtain his ends, and the chemist turned to the industries. Later, the physician turned back to his former aid and found substances which he made use of, such as ether, which was discovered in the thirteenth century, but not recognized as an anesthetic until 1846. The same is true of magnesium sulfate, and twenty-three years elapsed between the discovery of amyl nitrite by the chemist and the discovery of its medicinal properties by the physician. Thus many patients suffering from angina pectoris went without relief because of a lack of co-operation between chemist, pharmacologist and physician.

There has been a re-establishment of the recognition of the relation between chemistry and medicine. Each human body is now recognized as a chemical factory, in which complicated chemical and physical changes are taking place. When these are normal, good health results; when abnormal, disease results. Moreover, when natural resistance is lowered, resulting in infection by invading organisms, these organisms produce disease and death by chemical agencies (toxins), which act upon the heart, respiratory centers, or gradually poison the entire system.

The bacteriologist and pathologist have accomplished much in working out the causation of diseases, but they have now reached the point where they must turn to the chemist for the solution of many of their most important problems. To illustrate, antitoxins, most potent in combatting disease, are chemical substances of specific power but unknown composition. They are injected in the form of crude mixtures, laden with undesirable and sometimes harmful ingredients. The isolation of pure concentrated chemical principles would give us a definite exact dosage and swift action. As an example, rickets is a disease which bids fair to succumb to chemical investigation.

In the matter of foods, we now realize that, without vitamin content, they are analogous to Budweiser after the eighteenth amendment, but the chemistry of these essential food substances is still unknown.

Even the chemistry of the living cell is still little known and, since we live solely through the co-ordinated activities of differentiated cells for special functions, how can we have much knowledge of the body as a whole, when so little of the life unit is known?

The study of cell secretion, alkaline reserve, colloids and enzymes offer many chemical problems still unsolved, as also diseases of nutrition, pellagra, rickets and cardiovascular-renal disease.

In view of the vast chemico-medical problems to be solved, much has already been accomplished; salvarsan has shown us that there can be a specific chemical remedy for a specific disease; that is, a chemical remedy which destroys the invading organism without injury to the host, when used by proper technic. This was brought to a successful issue by close co-operation between chemistry and medicine, and we have further promises of specific chemical remedies for specific diseases, independent of any compounds that nature has supplied.

All this brings up the point of the existing facilities for chemico-medical research. In our country, we have a number of foundations and institutions for medical research doing much valuable work from a chemical viewpoint. Few lines of chemical investigation in relation to disease have been developed here. We have been dependent on foreign countries, especially Germany, for the application of chemistry to disease problems.

It would, therefore, seem that we have built a wonderful superstructure in medicine, but as yet do not understand the fundamental chemistry of the fine and sensitive powers of adjustment of living organisms. We have gone a long way through the earnest efforts of isolated and individual workers, but it would seem that we can best hasten the ultimate success by bringing together, for closest co-operative work, expert workers, in a well organized group, so their research work would be co-ordinated. By this method, a more determined attack could be se-

PRELIMINARY PROGRAM, ANNUAL MEETING, ARIZONA STATE
MEDICAL ASSOCIATION.

To Be Held at Prescott, Arizona, June 14th and 145th.

Presidential Address, by A. L. Gustetter, M. D., President Arizona State Medical Association, Nogales, Arizona.

Message from Honorable Thomas E. Campbell, Governor of Arizona.

ADDRESS IN MEDICINE, "Tuberculosis of the Brain," by Walter D. Sheldon, M. D., Rochester, Minnesota.

PAPERS

- 1—"The Early Diagnosis vs. Positive Diagnosis in Tuberculosis," by W. O. Sweek, M. D., Phoenix, Arizona.
- 2—"Abscess in the Lung," by Meade Clyne, M. D., Tucson, Arizona.
- 3—"Thoracoplasty," by Willard Smith, M. D., Phoenix, Arizona.
- 4—"Gland Therapy in Tuberculosis," by F. H. Redewill, M. D., Phoenix, Arizona.

- 5—(Title not given), by Donald J. Frick, M. D., Los Angeles, California.
- 6—"Kidney Function," by Charles S. Vivian, M. D., Phoenix, Arizona.
- 7—"Henoch's Purpura, Report of a Case," by James R. Moore, M. D., Clemenceau, Arizona.
- 8—"Development and Maintenance of Breast Milk," by E. M. Tarr, M. D., Phoenix, Arizona.
- 9—"Mental Hygiene in Arizona," by Thos. H. Haines, M. D., Phoenix, Arizona.
- 10—"X-Ray Therapy of the Tonsils and Its Limitations," by Will Wilkin-son, M. D., Phoenix, Arizona.

ADDRESS IN SURGERY, "History of the Diseases of the Thyroid and

the Development of Surgical Treatment," by Clarence Moore, M. D., Los Angeles, California.

- 11—"Infantile Spastic Paralysis," by R. D. Kennedy, M. D., Globe, Arizona.
- 12—"Some Experiences in Surgery of the Prostate," by Herbert Augustus Rosenkranz, M. D., Los Angeles, California.
- 13—"Roentgen Findings in the Common Bone Lesions," by James Thom, M. D., Jerome, Arizona.
- 14—"Osteomyelitis, with Report of a Case," by J. B. Nelson, M. D., Mesa, Arizona.
- 15—"Medico-legal Problems in Arizona," by LeRoy Anderson, Esq., Prescott, Arizona.
- 16—"Sacral Anesthesia," by A. J. Murrieta, M. D., Los Angeles, California.
- 17—"Anesthesia—and the Anesthetist," by H. R. Carson, M. D., Phoenix, Arizona.
- 18—"The Relation of Nasal and Accessory Sinus Disease to Asthma," by J. J. McLoone, M. D., Phoenix, Arizona.
- 19—"Food Addition Method in Asthma," by O. H. Brown, M. D., Phoenix, Arizona.
- 20—"Value of Blood Chemistry to the Practitioner," by P. B. Newcomb, M. D., Tucson, Arizona.
- 21—"The Fallibility of Clinical Laboratory Methods," by W. Warner Watkins, M. D., Phoenix, Arizona.
- 22—"Diagnosis of Endocrine Dystrophies," by Nelson W. Janney, M. D., Los Angeles, California.

cured on the conservation of health and cure of disease. The co-operative efforts of specialists in the individual sciences of organic and physical chemistry, biology, pathology, bacteriology and pharmacology, would make this is-

sue more rapid and certain.

Such a procedure should be fostered by every man of medicine and through such a procedure we may prophesy that medicine might be raised from the level of an art to that of an exact science.

WHY?*

DR. WILLARD SMITH, *Phoenix, Arizona.*

When death took from us our beloved Mother Paul, we lost more than we have yet had time to realize. This institution is peculiarly the embodiment of her hopes and ambitions and work. It was she who, through all the pioneer years, labored to make real the dream of useful service which was the guiding principle of her life. I have no doubt that others have shared with me the thought that her decisions were sometimes wrong. I know that I have often rebelled at heart when her opinions were not as I thought they should have been. But as time passed I have almost always found that her judgment has proved to be right. What seemed at the moment to be a just cause for criticism has usually turned out to be only another instance of her foresight and good judgment. This happened so often that I got into the habit of thinking that if she passed judgment on anything, even if I did not agree with her, it was pretty sure to come out as she predicted. She had the gift of far-sighted judgment. She was a builder. Her opinions were not based on the immediate benefit, but on the ultimate result. The impression she made on this hospital has only begun to be realized. As the years go on I am sure that we will see more and more the fruits of her planning.

She was the pioneer. She was the inceptive spirit of the organization, and

as executive head was a powerful factor in making dreams come true. She was taken from us just as we are about to garner the fruits of her long years of careful planning and hard work. But she was not alone in the work. Associated with her was a noble band of devoted women. Some of them have already been called to their reward, but we are still granted the presence and labors of those other Sisters who have worked as hard, each in her own capacity. The time of doubt and uncertainty, through which her unfaltering faith and perseverance was the guiding star, has passed, and she has left us a hospital which it is our duty to try to build up to the standard which she set. There is no doubt of the success of the venture now. Her work has made that certain. There is no doubt of the good faith and honest intentions of the Sisters, and of their willingness to carry on. That is self-evident. But it is not enough. We members of the Staff have our duty to perform as well. It is all very well to fully realize that this is the Sister's Hospital. But it is also our hospital. We will do well to absorb and emulate the same spirit which has actuated the Sisters. We must not sit idly by and expect that we are only to reap the benefits and do none of the work.

Before refinement is possible it is necessary to accumulate material. The

*An essay before the annual meeting of the Staff of St. Joseph's Hospital, Phoenix, Ariz.

Sisters have built from a very small beginning until there has resulted an institution which is large enough to be a trifle unwieldy. Mother Paul saw this and also saw that it must be better systematized in order that it might fulfill its destiny. The plant was accumulated and used and has done great good, but much effort was wasted because of lack of co-operation. The Sisters have always been competent to attend to the business side of the organization. But times have changed since the founding of even so modern an institution as this. Science has advanced and progress in hospital work has been so rapid that no one person could successfully keep pace with it. No hospital has the right to be anything less than the best. The product of a hospital is service. It is not doing its bit unless it is turning out a first-class product. This requires not only a competent business management, and an adequate equipment, but also the co-operation of the doctors and nurses and the co-ordination of the efforts of all. It was with the object of securing this in the greatest possible degree that Mother Paul was so keenly alive to the necessity of a well organized and efficient staff.

So the Staff was formed. It was made an open Staff so that all would be given an equal opportunity for service. Behind that was the greater purpose to subordinate the element of personal gain and to enlist all in a common cause of advancement. As in all new places, and old ones as well, the element of human selfishness has not been entirely absent. Those of us who have been here for some time can look back over the mutations of the rings and combinations which are a nightmare to one who has any belief in the justice of the Sherman law. I presume that so long as the race endures we will have those dominant spirits who will not hesitate to secure personal ascendancy by whatever means lies ready to hand. But, as I read history, these petty personal advantages are not what has ever built up anything which has endured. Selfishness always defeats itself. Waves beat on the shore

but only the tide raises the water level. It is futile to hope that homo sapiens has yet progressed to that point at which altruism is a dominant motive. We must accept the fact that the game is played as it is played, and make the most of it. We must accept the fact that most men measure their contacts with the world in terms of personal gain. To believe anything else is to chase moonbeams.

I presume that some of you are wondering what I am driving at. It is just this. I am trying to make an appeal to you to do that which is for your own personal gain and advantage. It is a well known fact that the steam which goes through the whistle cannot serve to drive the engine. Each of us has just so much steam to put into the effort which we are ostensibly making to make this a first class hospital. If we waste our energies in other than constructive things, we have that much less energy to apply to real building. There is no greater waste than useless argument and futile discussion, particularly about those things which do not concern us. And that brings me to the subject of this paper—Why?

One year ago this staff was formed. The object of this Staff was not to build or run a hospital. The hospital was built and was being run. The methods were faulty, of course. The faults of a commercial nature were none of our business. That side of the problem is the Sisters' business. If they choose to ask advice that is for them to do. If we have complaints it is our business to state them to the business office, just as we would do in any other business. We are not employed to run the finances of our patients. We are employed to restore them to health, if we can. Our ability to do this will not be enhanced by our meddling with a host of things which are foreign to our function. By spreading our attention over a variety of things we are bound to spread our attention very thinly over all. That is the secret of co-operation. Each fellow can do best his own part and can accomplish most just in proportion as he refrains from meddling with things that are none of

his business. I have noticed that a jack-knife which is screwdriver and a corkscrew and a chisel and a file and a scissors and a dozen other things is not usually much of a jack-knife. Our business is to be doctors. The great Leonardo was able to be a dozen things well, but we have few Leonardos among us. It seems scarcely necessary for me to quote the old saw about the jack of all trades.

The Staff was formed for a definite purpose. It was to plan and put into practice a methodical manner of handling the professional work of the hospital. It was to put into use a method of recording the work done in the hospital. It was to seek to curb some unprofessional practices. It was to provide a supervising board whose duty it was to analyze the professional work of the hospital and to call attention in a constructive and helpful way to errors and to invite constructive criticism. It was to have summaries of the hospital's work placed before it and to seek remedies for the weak spots in the work. It was, in short, to seek to make better doctors of us all and to raise the average quality of the work done in the hospital.

Let us see how well we have done this in the first year. It is only by knowing and acknowledging our shortcomings that we may hope to improve. I have not expected that the Staff would function well at first, and it has not belied my expectations. A start has been made, and if we have the saving grace of common sense we can make it worth while in time. So far it certainly has not made much of a record.

We have a lot of blanks which are good for a starter, but have the fault that they contain a wilderness of repetition. Any of you who have taken the trouble to really fill out the blanks will agree with me that they rival the income tax blanks. Patients cannot be standardized. He who would reduce all patients to certain cut and dried forms must worship the forms and disregard the patients. My personal method is

to disregard the set forms and write the essential history and findings and let it go at that. "If this be treason, make the most of it."

When the Staff was formed, two well known abortionists were pointedly omitted from the invitations. One of them has since operated in the hospital and the other one was major domo on the occasion of our most spectacular and best attended meeting.

The only analysis which I have heard of the work of the hospital was a very fragmentary report by the Superintendent, the juice of which was the statement that there had been only one operative infection in a number of cases. This made us wonder if it would bear investigation. Statistics are wonderful things when one makes them to suit. There is a Staff committee which should investigate and pass on all such reports at least once a month and which should seek the wrong things and suggest methods of correction, rather than the opposite. One of the most touching obituaries I ever read was written about a saloon keeper. It is surprising how many good things we can say about a fellow if we censor the report.

We have spent whole valuable evenings in random discussion about things which are none of our business and we have had a few papers which were carefully culled from textbooks. We meet only once a month, and there is some uncertainty as to how many months each of us may be here on earth to meet. All of this has given rise in my mind to the query as to why we meet. We are certainly not doing our work as a Staff.

Few organizations function properly from the start. This is no exception. A year's time should be enough for us to find the errors, or at least the more glaring ones. May I suggest that we start the new year with the intention of limiting our work to the proper function of a staff, and that we proceed to produce some of the results for which the organization was formed.

ACUTE INTESTINAL INTOXICATIONS IN INFANCY AND EARLY CHILDHOOD

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This subject is presented for your consideration because a very large number of these cases have come under our observation during recent years. Since these acute intestinal intoxications are very destructive to life, or, at least, seriously interfere with the essential nutrition of the young, the subject is of much importance to the general practitioner as well as to the pediatrician. The sudden and violent symptomatology with an early fatal termination leaves us stunned by the speed of the morbid process and chagrined at our inability to treat many of these cases successfully. Of a large number of names applied to this condition, the one of choice, which seems both applicable and descriptive, is "Acute Intestinal Intoxication."

In this country, Benjamin Rush was the first to describe Acute Gastro-Intestinal Intoxication. He observed the effect of seasonal and temperature changes in what was then known as "Cholera Infantum." Rush also began seriously to consider the possibility of the patient-to-patient route as a means of spreading the disease when diarrhea and digestive disturbances were epidemic. To Rush belongs the recognition of the possibility of spoiled milk in the summer months as a source of the severe intestinal conditions, antedating much of the modern conception of these severe intestinal disorders. The modern conception of these severe bowel disturbances dates to the work of Czerny, Finkelstein and Meyer, yet a host of others have done much to refute, or add to, our present knowledge of the intoxications. The American clinicians and students are now contributing some of the most creditable work to the difficult subject of intoxications, which has been sidestepped so long, as one of the most trying problems in medicine.

Many sections of the country have

conditions which are particularly favorable to some one disease or another. In the Southwest we wish to emphasize the semi-arid climate with its fluctuations. These conditions are favorable to severe bowel disorders when the variations of temperature are greatest. Accordingly, April and May, September and October are accompanied by the largest number of intoxications. Possibly other factors are important, as the overheated homes which cool slowly so that children when covered sufficiently for the chill of early morning become restless and throw off their night coverings. Thus the debilitated child, following a period of mild dyspepsia, or the chronic feeder, is especially apt to suffer, when subjected to sudden, or severe chilling. Many of the etiologic factors which predispose and excite acute intoxications are fairly well known. However, to know the exact role played by each of these is difficult, since there are so many deleterious agencies that may be present. The exact status of an infection superimposed upon a food injury, or vice versa, makes a clear-cut etiology. The element of cause and effect must also be borne in mind. We must think of constitutional disorders, an unstable nervous system, poor hygiene, parenteral infections, removal of the young too early from the breast, spoiled food, qualitative and quantitative errors of feeding, and especially the age incidence which shows that the period of life between six months and two years is the most susceptible time for acute bowel disorders.

SYMPTOMATOLOGY

The severe intoxications begin as ordinary gastro-enteritis, and, if seen early, the severe nature of the disease is not suspected; yet usually in 12 to 24 hours the disease assumes its typical characteristics. The vomiting is fre-

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quent and often projectile in type and if the baby is old enough it begs constantly for water. The child grabs the cup and literally throws the water down, and as the last drops are drained the child clings desperately to the side of the container. The water is hardly down before it is vomited, with scarcely time intervening for the fluid to become warm. This intense thirst is almost pathognomonic of the disease. The stools are frequent and, at first, contain very sour, offensive fecal matter, which is brownish in color. Later the number of bowel movements increase and the type changes to a serous and finally, to a characteristic rice-water stool, that may occur as often as 10 to 20 evacuations an hour. The abdomen is flaccid and sunken, but distention and cessation of diarrhea are noticed towards death. The child, from the onset, is very restless and throws itself about the crib. This symptom quickly changes to a profound prostration and to an intoxication which is marked. The skin takes on an ashen color and is cold to touch in spite of an extremely high temperature. The features are pinched, the eyes appear sunken in bluish orbital depressions and the conjunctive appear dry and glazed. Radiating episcleral vessels become sharply defined as deep red lines which extend from the palpebral borders centrally; these lines, we have observed, if they increase in diameter and number, forebode death. The early initial temperature may be followed by a rapid rise to the unusual height of 106 to 108 F. The early period of restlessness is succeeded by a shocklike appearance and a complete collapse; the child is profoundly toxic and the prostration is marked. The excitement gives way to a dull, heavy and listless mental state. The breathing, at first deep, rapid and labored, fails and appears irregular as it assumes the Cheyne-Stokes type. The early rapid bounding pulse becomes weak, intermittent and finally imperceptible. A high terminal temperature develops, the vomiting and diarrhea stop, the respiration and pulse fail as the end approaches. Death usually comes as the climax of a violent convul-

sion. This is a sad picture, indeed, and once seen it is not easily forgotten.

COURSE

The course of the acute intoxications, as described above, is either rapidly fatal, or a form somewhat modified in severity, yet ending fatally after three or four days, or the type which terminates as a severe acute enterocolitis. The latter variety resembles much the convalescence of typhoid fever. Variations in the symptomatology are seen, but it is quite the exception to see a case devoid of vomiting or diarrhea, although such types are occasionally found. Occasionally a case detoxicates without the long convalescence seen in most recoveries. At all events, it must be considered an extremely dangerous disease.

PATHOLOGICAL CONSIDERATIONS

Pathological investigations have, at least, opened a route for an attack on the acute intestinal intoxications along physiological and pharmaceutical lines. In the absence of elucidating post-mortem findings, some of the outstanding facts placed at our disposal give us, at least, an insight into some of the factors involved.

1. Severe chilling may stimulate the sympathetic nervous system with a resulting hyperperistalsis and an unusual activity of the biliary tract. Coincident with a biliary discharge into an already irritable and empty gut, the bile acts as a powerful cathartic; or if in the presence of an infection, or of a food injury, the effect of such stimulation may result disastrously to the baby.

2. So called Acidosis in acute intoxications is not due to acetoneemia, as is usually supposed, but to a high concentration of the acid phosphates in the blood stream. Hence the usual ineffectual administration of bicarbonate of soda in these cases, except for the small amount of true acidosis which is often present. When the osmotic pressure of the crystalloids in the blood stream exceed the osmotic pressure in the renal glomeruli, the kidneys fail to excrete many of the injurious metabolic products. Clinically and chemically there is a true uremic acidosis. This fact is

borne out clinically by the respiratory rate, the irritation to the central nervous system, as well as chemically by blood analysis. Anhydremia consequently increases the symptoms of acidosis and uremia.

3. That a functional intolerance of the gastro-intestinal tract may develop during dehydrated conditions is an experimental and a clinical fact. Administration of food or fluids acts as the exciting cause of the vicious vomiting cycle that develops after feeding at these times. The more food given the lower the tolerance becomes and the more persistent the vomiting. Thus the rationale of the early withdrawal of all food and fluids by mouth if vomiting is present.

4. The presence of unutilizable crystalloids in the blood, whether absorbed from the tissues as a result of increased metabolism, or from the bowel, carry with them in excretion a large amount of water. It is obviously necessary to withhold food and hypertonic solutions to avoid the danger of further depletion of the body fluids.

5. Although disputed, Finkelstein's view that there is an increased permeability of the gut during an intoxication seems to us clinically important. Whether it is the absorption of crystalloids with a further upset of the water balance, or the diffusion of unsplit proteids in the blood stream, the toxic manifestations rapidly become aggravated after feeding.

6. As an intoxication progresses, and as the body fluids are drained away, the blood shows an increased specific gravity, a high index of refraction, an increased viscosity and an increased electrical conductivity. There is a tremendously increased urea and non-protein nitrogen content with a high Am-bard coefficient; a high equivalent of corpuscles in the ash residue, and a tremendous increase in the osmotic pressure. Examination of the venous and capillary blood shows enormous discrepancies in the count, thus indicating an engorgement of the blood cells on the arterial side of the capillary circulation.

7. The shocklike appearance of the child is not true shock. The stagnation of the cellular elements of the blood in the precapillary spaces gives the peculiar ashen pallor to the skin. The cold surface is the result of a decreased circulation, due both to the precapillary accumulation of blood cells and a peripheral vaso-constriction which apparently attempts to compensate for the diminished volume present as a result of fluid losses.

8. The urine analysis consistently shows a negative balance in water, in nitrogen and in salts. This may be explained by the utilization of the body tissues during the tremendous increase of metabolism and a retention of solid elements during kidney failure with the resulting loss of water by bowel, vomitus and the lungs.

9. The recovery of a child from an intoxication is directly in proportion to the approach to the normal protein concentration of the blood. As the blood stream is diluted and the tissues are replenished with fluids, the normal nutrition is again resumed and a proper water balance is established. A considerable period follows after the blood reaches a normal concentration before the baby begins to gain.

10. Powerful and continuous purging, which is so frequently resorted to, cannot be expected to aid in bringing about a favorable prognosis. On the other hand, prolonged chemical irritation promotes the pathological process, i. e., the dehydration, which is the chief factor in producing death.

11. The establishment of a favorable water balance is the salvation of the child. The route of preference must be that which offers the quickest absorption of large quantities of water when given to the baby. The rate of peritoneal absorption and the chances for putting large quantities at the patient's immediate disposal in a minimum of time makes the belly route frequently the method of choice. The speed and safety of the peritoneal method has been fully established. The subcutaneous route is sometimes used, and gavage is sometimes successful.

DIAGNOSIS

An established case of acute gastro-intestinal intoxication is not readily confused with other conditions. The violent onset after dyspepsia, the rapid dehydration, the insatiable thirst and the profound intoxication, are unmistakable. If seen late for the first time, the nervous symptoms may simulate uremia, a poliomyelitis or even a meningitis, but the history and other findings usually make the case clear. The hope of these cases is the early recognition. This is accomplished only by the eternal vigilance of the physician and the education of the laity to the danger lurking in bowel disorders. Consequently, consider all intestinal disturbances potential intoxication and follow each carefully for at least 24 hours.

TREATMENT

Prophylactic: The adage, "a stitch in time saves nine," was never better exemplified than it is in this disease. It is in the early recognition of acute gastro-intestinal intoxication and the institution of heroic treatment that we hope for favorable results. And yet it seems that in a certain percentage of cases death results no matter how early seen or how vigorous and skillful the treatment. It is these fulminating cases that are truly the despair of the physician and the puzzle of the profession at large. The aphorism that "prevention is better than cure" is fully applicable. Since the acute intoxications practically all give an antecedent history of indigestion or some mild gastro-intestinal disorder, the lurking danger and the potentialities of the mild bowel derangements should be constantly borne in mind. Once a case of persistent vomiting with diarrhea has developed, keep in intimate touch with the developments of the condition until at least the following day. It is better to make too many visits than too few, for the most experienced physician is, at times, misled by this type of case.

The exercise of the accepted rules of infant feeding and general care is a most excellent prophylaxis. To be specific, never wean a baby without a definite indication, for the breast-fed infant has five times more chances of

living than the bottle-fed baby. It is desirable to maintain a few nursings when complemental feeding is instituted. To be accurate in this work is to maintain a check by accurately weighing before and after nursing. When feeders do poorly under artificial, or complementary feeding the value of the wetnurse or an occasional nursing is to be remembered. The qualitative and quantitative check on the diet of the bottle-fed baby needs constant watching. We frequently can ascertain the cause of the failing breast-milk supply and readjust the mother's habits of living, or the diet, or improve her mental attitude with beneficial results. Glandular therapy, we find, offers considerable hope of aiding the mother when given in the mammary and the placental combinations.

With our frequent high elevations of temperature during practically the whole year, it is imperative that you be sure of your milk supply. Boiling is a wise precaution, but boiling does not make good food nor render spoiled milk non-injurious.

We are convinced that chilling, as seen during the wide temperature changes, has a marked influence on the incidence of the acute bowel disorders. It is, therefore, necessary to protect the infant from the extreme temperature changes. We advise the wearing of bands of wool, or part wool, from birth until the end of the second summer.

ACTIVE TREATMENT

Unfortunately, we have no specific remedy and our treatment is largely symptomatic. At the very onset of an acute gastro-enteritis stop all foods for a period of 12 to 36 hours. Boiled water with a 1 to 2% soda bicarbonate content, in one-half to two ounce quantities at intervals, varying from 15 minutes upwards, is given as needed to satisfy the thirst. A quick emptying of the bowel at this stage is desirable, but the stomach is often repellant to food or irritating drugs. Consequently, castor oil is usually contraindicated because of its tendency to provoke emesis. It is preferable to use the soda with one-quarter grain calomel combinations at short in-

tervals until one or two grains are retained. An initial colon irrigation, consisting of a gallon of normal salt and a 2% soda solution is highly desirable. If the antipyretic effect is desired, use the solution cool; otherwise, the warm irrigation is preferable. At the cessation of vomiting frequently repeated doses of deodorized tincture of opium with bismuth are very useful in checking the diarrhea. The cases which survive the initial attack of the acute intoxications and develop an enterocolitis are treated as the type and severity of the disorder demand.

The cases which show persistent vomiting and diarrhea in spite of the early treatment require more active measures. First, a hypodermic of morphine with atropine suitable to the age of the infant should be given at 2 to 3 hour intervals until the desired therapeutic effect is produced. The doses of morphine usually employed are 1/100 gr. for a 6-months child; 1/75 gr., for a 12-months infant; and 1/50 gr. for an 18-months to 2-year child. Atropine, while well tolerated by children as a rule, is given in 1/1500 to 1/500 gr. doses as the age requires. Gastric lavage with a 2% soda solution given warm often helps to relieve the vomiting; the last 6 to 8 ounces, when left in the stomach, is often retained with very beneficial results.

To combat the dehydration is our most serious problem. We must neutralize the rapid loss of fluid and, if at all possible, maintain a favorable water balance. The two most practicable methods are the subcutaneous and the intraperitoneal routes. The intraperitoneal method is the preferable operation since a larger quantity of fluid can be given easily and quickly with a very rapid absorption. As much as 150 to 400 cc. of fluid can be given at one time and repeated in 3 or 4 hours if needed. The fluids that are advantageously used are normal saline, normal saline with 5% glucose, or Ringer's solution. In certain cases the nervous irritability of the stomach is only temporarily controlled with the morphine and atropine combinations, while chloral hydrate and sodium bromide are

fairly well retained. In these cases the chloral and bromides are pushed until the sedative effects are attained.

Hot packs are frequently employed for their analgesic and quieting effects, while tepid packs have marked antipyretic value when given over a period of 20 to 30 ounces. Cold or chilling, except to the head, has a very depressing effect and seems to increase the shock-like symptoms.

Once the vomiting has stopped, we must proceed very cautiously. Fluids in the form of soda water, or very weak tea, may be given in one-half to one ounce quantities at 15 to 30 minute intervals, as needed. Food when resumed after a 24 to 36-hour starvation period must be given in very small quantities. It is wise to begin feeding with quantities of one to two ounces at the start. Milk products high in protein, as the Eiweiss milk, commonly known as buttermilk casein, or diluted skimmed milk with the commercial calcium caseinate, are the foods best adapted at this time. Combining a high protein diet with frequent small doses of opium and bismuth, the course of the diarrhea is usually short. The approach to the normal quantity of the protein milk is usually of short duration. Aversion to the bitter taste of the protein foods can be overcome with saccharine or with the addition of small quantities of unsweetened cocoa. However, the average child is sufficiently hungry and will readily take the food without masking the flavor. The early institution of carbohydrates in some form, preferably a dextrin, aids in a more rapid convalescence. Some children who recover from the diarrhea and intoxication die probably from the need of an easily assimilated food; hence the advisability of giving carbohydrates as soon as they will be tolerated.

When stimulation is needed, the child is usually too far gone for this to be of much value. Small doses of pituitrin seem to improve the cardiac action as well as aid in overcoming the toxic ileus with distention. Camphor and oil hypodermically give temporary aid in maintaining the circulation. Strophan-

thin is frequently resorted to and gives good temporary results. Eserine may be employed to improve the tonus of the over distended bowel that is so embarrassing to cardiac and respiratory functions.

In conclusion we may assume that the final solution of the problem of the acute intoxication of infancy and childhood will be the summation of the work of observers. We feel that the addition of any observation will aid the profession in the ultimate control of this serious menace to early life.

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COMMON INFECTIONS OF THE KIDNEYS*

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The first and last impression I wish to leave on my hearers is that it is a much rarer talent to suspect that kidney infection is present than to diagnose it accurately after it is once suspected. In order to get before your mind's eye the all-important predisposing factor in renal infections, I wish to appeal to each of you to analyze your own experience regarding the lack of easy drainage in your surgical cases and its large proportion to the remainder. For this purpose, I present the following classification:

CONDITIONS FOR WHICH SURGERY IS DONE

I. Neoplasms

II. Plastic (Broader sense)

(a) Plastic Surgery Proper

(b) Orthopedics and Reconstruction

(c) Correction of Other Physical Defects, e. g.

Fracture
Hernia
Hydrocele
Cataract, Etc.

III. Surgery Endocrine Glands,

IV. (a) Surgery Intended to Facilitate Drainage of Natural Secretions and Excretions

Common duct stone
Gastro-enterostomy
Colostomy
Adenoids
Turbinates
Ureteral transplantation

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(b) *Drainage for Products of Inflammation (either by removal or simple drainage)*

Pus tubes
Appendix
Tonsils
Sequestra
Alveolar abscesses
Gall-bladder
Frontal sinus
Mastoid
Middle ear
Empyema
Ischiorectal abscesses
Perinephric abscesses
Paronychia, etc.

These are only a few samples, but one could go on naming them indefinitely. I venture the assertion that over fifty per cent of the surgery done is for drainage, assuming the above concept as drainage.

The kidney, instead of being the exception, is perhaps the most dependent on drainage of any organ in the body. For this reason, kidney infections have far more relation to this factor than to the presence of pyogenic organisms in the blood stream. True enough, specific pathogenic organisms, usually coming from a more or less remote focus—the focal infection of Billings—must be present to produce such lesions; but if there is no hindrance, appreciable or otherwise, to the urinary outflow, producing back pressure, ever so slight, stasis, or both, there is small risk of infection unless the dose of bacteria is overwhelming or the virulence extremely high. With perfect drainage, if there is infection, recovery takes place easily. In other words, the more cases one sees and the more carefully he has studied them from the urologic standpoint, the more he is convinced that mechanical factors are the all-important predisposing elements in their etiology. One does not need to assume actual obstruction; to illustrate, if one is using an ordinary sprinkling hose and rotates the nozzle to decrease the size of the jet, and the water is emitted in a smaller stream with greater force, he must assume that the rubber walls and fabric of this hose tube will have a much shorter life with an

equal amount of use and abuse than if the point of ejected stream were of the same caliber as the rest of the channel.

It is extremely probable that we all have intermittent bacteremia, the bacteria being absorbed through the lymphatics and passed on into the blood stream from foci of infection at various more or less distant parts of our anatomy. We believe that the protective processes of the body combat these, and in most instances there are created no severe infections in other organs for a considerable or prolonged period unless an individual organ is predisposed; or unless by over-fatigue, exposure and chill, worry, anemia, malnutrition or some such factor, general as well as local, lowered resistance is produced.

The causes of back pressure or lessening of the free outflow of urine from the kidney are as follows:

I. *Urethral*

- (a) Stricture, congenital or acquired
- (b) Contracture of the bladder neck
- (c) Hypertrophied prostate
- (d) Carcinoma of the prostate
- (e) Rarer causes
 - Stone and neoplasm
 - Urethral diverticulum
 - Phimosis and pinpoint meatus

II. *Ureteral*

- (a) Ptosis
- (b) Aberrant renal vessel branch
- (c) Calculus
- (d) Angulation or kink
- (e) Stricture or congenital narrowing
- (f) Neoplasm of ureter or kidney pelvis
- (g) Filtration and atony of the ureteral walls (inflammation)
- (h) External pressure
 - Pregnancy
 - Neoplasms
 - Pathologic lymph glands
 - Inflammatory exudates and cicatrices therefrom, as pus tubes and abscesses of the seminal vesicles.

(i) Neoplastic infiltrations (carcinoma of cervix and bladder)

I am purposely giving the rare ones. But stricture, prostatic hypertrophy and prostatism from contracted bladder neck are the common urethral causes and the percentage of infected urine direct from one or both kidneys from these conditions with the so-called accompanying chronic cystitis, is surprisingly high, although the clinical symptoms are not usually those of pyelitis, and the treatment of the obstructive condition in the urethra is, in most cases, the best and only treatment needed. These are apt to be, but not necessarily, bilateral infections. Pathologic kidneys requiring renal surgery, on the other hand, are prone to be unilateral. The cases due primarily to urethral obstruction usually recover to a great extent by relieving the obstruction, with cessation of progress in the secondary kidney involvement and often with clinical recovery.

In the cases due primarily to mechanical factors in the ureter itself, a different condition obtains. The ureter being such a small tube, when encroached upon is further stenosed at one or more points. An angulation, external pressure or infiltration of the wall makes drainage highly difficult. One not infrequently sees enormous hypertrophy of muscle in the kidney pelvis therefrom. It seems to be a prevalent opinion that pyelitis or pyelonephritis is usually bilateral. This is not the case, however, as attested by many leading urologists of the world. In children and many women bilateral infection is common. The probable explanation of this in children is that they haven't lived long enough with bacteria to develop an appreciable degree of immunity. Ptosis is a factor in adult women in a surprisingly large percentage of cases.

Many times the scars of battle are left on both sides. But often both kidneys recover completely or only one side bears permanent marks of previous inflammation. With modern instruments and modern technic we have little difficulty in catheterizing the ureters of the great majority of chil-

dren. The results of this simple treatment are often amazing. There can be little doubt that many of the cases of pyelitis of pregnancy are dependent on previous pyelitis of childhood. When we say pyelitis, we always assume nephritis as part of the pathologic picture. It is always a pyelonephritis, although the proportionate degrees vary. Pregnancy being a normal state, why should we have kidney infection except in a previously damaged or poorly draining organ or with marked foci of infection elsewhere? In the light of more recent investigations, the so-called septic multiple infarct is probably in many cases a lymphatic absorption. Hence, latent infections, not omitting cases in women and children, should be investigated adequately.

Regarding micro-organisms concerned in the production of the infectious nephritides, the colon bacillus has long been the scapegoat. In 1901 Le Fur seriously questioned whether it was the real causative factor or a secondary invader. Clinically, it has seemed in comparing cases of colon baccilluria that the less the amount of pus (down to none at all) and the less the clinical manifestations, the greater the abundance of bacilli in the urine. In cases with no pus whatever, and the urine opalescent from the *B. Coli* alone (not even enough other sediment to carry them down when centrifuged), there are usually no clinical symptoms whatever. The less the proportion of bacilli and the greater the proportion of pus usually means increase in serious symptoms and increase in pathology. But for a long time many urologists and eminent pathologists have been inclined to believe that the *B. Coli* was a secondary invader at its worst and often by reason of its antibiotic properties towards the growth of other bacteria—especially cocci—that it had a distinct therapeutic value. Recently, Bumpus and Meisser of the Mayo Clinic, in conjunction with the laboratory of Rosenow, have demonstrated that infections of the teeth and tonsils, especially, have produced a green streptococcus in cultures from apical granulomata, capable of producing lesions in

the kidneys and bladder when injected into the blood stream of animals, which on further culture prove to be pathogenic for the upper urinary tract in other animals. In these animals the predisposing mechanical factors were seemingly absent. But we must take into consideration the fact that in streptococcic infections a particular micro organism develops a special predilection or facility to infect that particular organ on inoculation into another animal; and that the same result will be brought about by growing these organisms in culture to which is added that particular tissue, such as kidney for example, and in these cases no doubt the organism develops a selective affinity for this particular organ. Clinically, however, we must assume other factors. With a focus of infection in a tooth or tonsil prior to its dissemination and localization in some more or less distant organ through the medium of the blood stream, it should be quite exceptional for the particular strain to possess specificity for a remote organ. Hence, one finds it plausible to expect (and clinically true in a surprisingly large number of cases) to find local lowered resistance in the particular remote organ affected. The specificity must be developed later after the kidney infection, for example, is well established. In other words, the primary infection of the kidney depends on the bacteremia plus the mechanical factor without the aid of specificity.

In this work at the Mayo Clinic, the streptococcus was the prevalent organism cultured from the teeth and tonsils. The healthy tooth of a dog was extracted with the greatest approach to asepsis possible under the circumstances and the apical cavity infected with a pure culture of this green streptococcus obtained from an apical abscess of patient with clinical pyelonephritis, sealed over, and this same dog developed typical kidney infection.

Colon bacilli obtained from the urine of pyelonephritis cases when injected into the blood stream of animals produce a very small percentage of infected kidneys. (Helmholz) Inverse-

ly, cases injected with pure cultures of green streptococci and producing grave septic kidneys fail, in a majority of the cases, to cause elimination of the streptococci in the urine, but is accompanied by a colon bacilluria when no colon bacilli had been injected. It seems, therefore, that the streptococcus is a very common infecting organism and that the colon bacillus is incidental, secondary, or at times a really helpful organism, for the reason that it keeps the urine acid and prevents ammoniacal decomposition, and by its antibiotic properties towards the staphylococcus. In many cases of typical so-called colon bacillus pyelonephritis, an early examination discloses frank streptococci in the smears of the sediment from the urine taken by catheter and examined at once before bacteria have had a chance to multiply perceptibly. These disappear very soon as a rule.

Recently Rosenow, working with the Urologic and Dental Departments at Mayo Clinic, isolated a strain from the urine of a case of infected kidney with stone, which produced stone in 80 per cent of the dogs inoculated. This might possibly be due to the highly developed urea splitting power of these special strains of cocci.

The streptococcus and colon bacillus infect the pyramids, medulla and cortex in a more or less wedge-shaped manner. The staphylococcus, on the other hand, is inclined to infect the cortex directly underneath the capsule and is of a milder type and much less likely to lead to the necessity of nephrectomy. These minute abscesses directly underneath the capsule and in the adjacent perinephritic fat are apt to result in perinephritic abscess and complete recovery after drainage of the abscess in the lion with no, or little, infection of the kidney pelvis. Chronic staphylococcic infection is often secondary to other pathology—e. g., stone or hydronephrosis. Tuberculosis probably always begins in the glomerulus and the bacilli, breaking through the damaged capsule of Bowman, secondarily affect the tubules and the infection manifests itself grossly in the pyramids and pelvis. Later it travels from

here towards the cortex by lymphatic invasion just as is the case in the infections described by Brewer as septic infarcts and manifested in acute septic infections by wedge-shaped foci of necrosis, which correspond to the lymphatic distribution and not to the arterial distribution as originally put forth by Brewer. Parenthetically, this is some proof that the acute fulminating infections are not new infections, but sudden fulminating lighting up of old latent infections.

No matter if a human being has focal infections of pyogenic nature or marked active tuberculosis (meaning certainly in each case that there is an intermittent bacteremia) the incidence of infected kidney is small unless there is lessened local resistance by reason of back pressure. The studies that have been made of a great number of pulmonary tuberculosis cases taken from the great clinical centers for this disease, namely the sanatoria, show a very surprisingly low percentage of urinary tuberculosis. Likewise, hospital cases of pyogenic infections of all kinds with grave constitutional symptoms and evident blood stream absorption reveal a very small incidence of kidney infections. The reason is apparent, notwithstanding the evident foci of infection; simply there is no lowered local resistance.

Other micro-organisms found in these infections are usually secondary invaders such as the bacillus proteus. Gonococcic pyelitis is very rare.

The *symptoms* of kidney infection are oftener than not markedly illusory. Patients not infrequently appear with one kidney totally destroyed, without history of a single pain attributable to it. Tuberculoosis is seldom diagnosed until there is marked secondary involvement of the bladder, for the reason that the true condition has not been suspected. Pyuria, irritable bladder that persists for months with an acid urine in which no micro-organisms can be demonstrated by the ordinary staining methods, is apt to be tuberculosis. The finding of tubercle bacilli in such a urine is apt to be a tedious process, but they should always

be searched for diligently. The urine should be examined repeatedly at intervals of two or three days until the tubercle bacilli are found or one is satisfied that further search is useless. Guinea-pig inoculations should also be resorted to, but we have learned to place more dependence ordinarily on the smear for the reason that no prolonged wait is entailed. Often one can make a positive diagnosis of tuberculous kidney without finding the organisms; for instance—where frank pus with a mixture of little or no urine is withdrawn from one kidney and the cystoscopic appearance of infiltration, granulation and necrosis around or near the ureteral meatus is seen with or without the presence of tubercles in the bladder. The cystoscopic appearance, in other words, often enables you definitely to identify a pyonephrosis as tuberculous when repeated search has failed to disclose tubercle bacilli. It is extremely important to diagnose these cases at the earliest possible moment; otherwise the other kidney may become involved and even if it escapes, the tuberculous changes in the bladder will have progressed so far that their healing is often a process of months, up to a period of two years, and possibly will never heal if too far advanced.

Infections due to pyogenic organisms may often be relieved either entirely or partially by appropriate cystoscopic measures, if diagnosed in time. If focal infections can be found they should all be attended to if there is any doubt whatever as to their being a factor in the urinary pathology. In this connection, I wish to lay stress on the great value not only of pyelograms but especially of ureterograms. With a suitable x-ray machine, stereoscopic bilateral pyelo-ureterograms may be taken with no more pain or disturbance, as a rule, than in the unilateral procedure. If one is careful to ascertain the presence or absence of pus, its proportion and micro-organisms, the dye function, and the ease with which each side is draining as evidenced by the drip through the ureteral catheter, bilateral pyelography is as free from danger and

serious consequences as any other major diagnostic method. It gives you the mechanical factors of the ureteral lumen, it reveals the nature and extent of previous pathology, both in the kidney and ureter, to a great extent. If it is not done we are frequently in the dark and we continue to use ill-advised, often harmful and seldom helpful methods in our treatment.

Let me reiterate, in almost every unilateral case, by studies before such a time elapses that advanced and overwhelming pathological changes mask the real etiological factor, one may find

an important cause in the lack of drainage. In the pyelitis of pregnancy we believe almost always it is a lighting up of old pathology. This is also probably true of the hyperacute focal kidney infections—the so-called fulminating cases so prominently pictured by Brewer a few years ago.

The treatment of kidney infections is such a large subject and, aside from nephrectomy and removal of stones, is so obviously a class of work intended for the specialist, that I will not attempt to bore you with a discussion of a mass of highly technical procedures.

PRACTICAL APPLICATION OF THE TESTS OF THE VESTIBULAR APPARATUS*

DRS. STEPHEN A. and FRANKLIN P. SCHUSTER, El Paso, Texas.

The tests of the vestibular apparatus, in our newer light on neuro-otology, and the physiology of the inner ear, are absorbing studies. What the average clinician is interested in, however, is, (1) What is its practical value? (2) How can this knowledge be used in daily work without going through a long, complicated or impractical examination?

As the attention of the medical world is directed toward any new, revived or modified method of diagnosis or treatment, the tendency of the mass of medical men is to doubt its value. A few who investigate become extremely enthusiastic, and, in their enthusiasm, overlook many possible sources of error and explain away many inconsistencies. Finally, between the two extremes, after there has been a large number of clinical observations and experiments

by the great body of the medical profession, its true value is ascertained.

We believe we are just beginning to learn the true clinical value of the tests of the vestibular apparatus. It is therefore our idea in this paper to urge a wider use of these tests by the great body of clinical men. The tests we refer to are the rotation and caloric tests of Barany, the technic and standardization of which have been so ably worked out by Drs. I. H. Jones of Los Angeles, and Lewis Fisher of Philadelphia.

In the routine examination of a neurological case it is customary to examine the function of each cranial nerve. The value of examination of the eye has long been recognized. The pupillary reactions, the fields of vision and the fundus often give remarkable diagnostic aid. Even in medical and surgi-

*Read before the joint meeting of the Medical & Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society at Phoenix, Ariz., December 1-3, 1921.

cal cases, such as diabetes, nephritis and syphilis, we have information in the eye. In examination of the ear, until relatively recently, the doctor has been satisfied with a slipshod examination of the hearing—the cochlear portion of the eighth nerve—and has disregarded, in most instances, the vestibular portion where we have an extensive and exact field with intimate connections in the medulla, pons, cerebellum, cerebrum and, through these, with the eye and the entire voluntary musculature of the body, from which to gain diagnostic and localizing information.

It is assumed that you are all familiar with the Barany-Jones chair for making the rotation tests. It is simply a smooth running rotating pedestal chair with foot stop-lock and a head fixation apparatus.

It is not necessary to go through a long and impractical examination to determine whether the vestibular apparatus is intact or not. The patient is first examined for spontaneous phenomena as nystagmus, past pointing or falling reactions. He is then placed in the Barany-Jones chair and with the head held thirty degrees forward, in the plane of the horizontal canals, is rotated first to the right and then to the left at the rate of ten times in twenty seconds, and the character, amplitude and duration of nystagmus and vertigo noted after each turning. This is repeated at the rate of ten times in ten seconds and past pointing tried. This tests both horizontal canals and their central pathways and if the reactions obtained are within the normal we can conclude that this portion is normal. The vertical canals are similarly tested by rotation with the head held one hundred twenty degrees forward. This examination should not take, at the outside, more than five minutes.

If, however, some response is absent, subnormal, exaggerated or perverted, then it becomes necessary to go into detail, separating each ear, each canal and each central pathway to determine where the function of the vestibular apparatus is interrupted. It is true that these details may be too impractical to

go through routinely by the average clinician. This portion of the examination should be done by the specialist and the field rightly belongs to the otologist.

Of course, in well advanced cases with classical signs present, these tests are not needed for diagnosis, although they do give valuable additional information as to location, extent of pathology, operability, and prognosis. That is, in a case of brain tumor, for example, with severe headache, slow pulse, projectile vomiting, choked disk and possible focal symptoms, the diagnosis is easily made without the vestibular tests. The tests are indefinite or only corroborative of a diagnosis made on more direct evidence. In fact, it is in these advanced types of cases where the tests are the least reliable. It is the early and rather vague cases of replacement tumors, etc., where we do not have extensive lesions or associated pressure effects to interfere, that the tests are of the greatest value and the most reliable.

This is especially true in the large number of cases in ordinary practice who come to us vaguely complaining of vertigo. This symptom, so common to a large number of different diseases, may mean only a trivial thing, as impacted cerumen or refractive error, and yet it may be the first indication of a serious condition in the brain actually menacing life. We now know that all organic vertigo means involvement of the vestibular apparatus,—the inner ear and its central pathways. The practical application of these tests gives us definite information as to pathology in the ear, in the brain, or conditions outside of the vestibular apparatus affecting it in a toxic or reflex manner.

Where the vestibular tests have failed so far has not been due to faulty responses, but to faulty technic, or faulty interpretation of the responses obtained. The constancy of the normal responses has been amply proven by the very large number of routine examinations for candidates for the air service of the U. S. Army.

I shall not discuss the technic further than to say that if we expect results, it

must be exact, uniform, checked by stopwatch and repeated if pathological.

Interpretation of results is the hardest thing the otologist is called upon to do. It is here that the over-enthusiastic otologist is most likely to fail. He should not force himself into a clinical diagnosis simply from the results of the tests. His interpretation should disregard the clinical picture entirely,—as the Wassermann reaction does. That is, he should first summarize the results and then find one anatomic location which could account for all the reactions obtained. His interpretation should read, for example, 'interference with vestibular responses at the decussation of the superior cerebral peduncles,' and not "tumor or cyst" at this location. Then, if on post-mortem, we find a tumor in some distant area and not involving this location, it does not mean that the vestibular tests gave a false reaction. The vestibular paths were actually blocked at the indicated location not by the tumor growth, but by the associated pressure effect. Microscopic examination would undoubtedly show some evidence of degeneration at this point due to the pressure and account for block of normal reactions. This is why the tests are least reliable as a diagnostic aid in advanced cases.

What we should do then, is to use these tests more generally, especially in vague cases and then check up the report of the otologist by further clinical observation, experiment, surgery and post-mortem examination. This is the only way their practical application is going to be of great value as an aid in clinical diagnosis. We shall learn in this way that blocking of certain responses from the vertical canals, for example, does not mean tumor of the pons, but an internal hydrocephalus and soon we shall be able to offer clinical diagnosis in addition to anatomic ones with a reasonable degree of certainty.

Granting that there are many possible sources of error in making a diagnosis from the tests, still there are certain groups of cases in which the tests give very definite information where

other means of arriving at this diagnosis are indefinite or lacking. It is these types of cases to which we wish to direct attention.

In the occupational lines, the tests give rapid and accurate information as to the adaptability of applicants in certain lines of work. Steeple-jacks, construction workers, aviators, etc., where safety so largely depends on an intact vestibular apparatus, should all be submitted to these examinations.

In malingering, as deafness, vertigo and neurologic symptoms, the presence or absence of proper responses from the vestibular apparatus often determines their true character.

In acute labyrinthitis, decision as to operative interference depends on the complete destruction of the labyrinth, according to Ballenger. This complete destruction of the labyrinth is determined only by the vestibular tests.

Case M. G., male, 25 years, was referred to us with the complaint of vertigo associated with nausea, slight deafness and headaches of two years duration. His physician reported that he suspected an intracranial condition and that his general physical examination including teeth, urine and Wassermann was negative. The nose, throat and sinuses were negative; ears negative except for moderate conduction deafness. Applying the vestibular tests we were able to report "normal vestibular apparatus." The eye revealed no pathology except for a marked off axis astigmatism. As refractive errors frequently affect the vestibular apparatus in a reflex manner, this error was corrected fully and gave prompt relief of symptoms.

We cite this rather simple case to illustrate the fact that indefinite cases wander from physician to physician variously treated as brain tumor cases, syphilitics or as gastro-intestinal cases, etc., because headache, vertigo, nausea and vomiting are symptoms so common to diversified pathology. The tests systematically rule out the ear and brain as the site of the pathology.

Cerebello-pontine angle tumors give rather characteristic responses, so that we may almost class these responses as a symptom complex. Absence of all responses on the affected side and absence of responses from the vertical canals on the opposite side points rather definitely to pathology in the region of the cerebello-pontine angle.

In conclusion, we again urge the wide use of these tests as an aid in clinical diagnosis. Otologists should give an unbiased anatomic interpretation of the responses obtained, leaving their clinical significance to be determined by further observation, experiment, surgery, and post-mortem examinations. In

this way we shall soon build up, on clinical experience, a series of vestibular symptom complex responses, many of which may become as valuable in brain pathology as the Wassermann and the Widal tests are in syphilis and in typhoid fever.

NOTES ON AN UNUSUAL CASE OF LEPROSY*

By DR. ALEXANDER WALLACE, Nogales, Arizona.

A Mexican waiter, age 51, presented himself for examination and treatment on Sept. 11th, 1919.

CHIEF COMPLAINTS: Pains and aches lachrymation, fever and diarrhea.

PRESENT SYMPTOMS: For five years he has suffered pains and aches. These would be of several types: Pains and aches throughout bones and soft parts, worse at night and on movement, but constant in moderate intensity. Very sharp pains originating in the buttocks, and extending to the feet, lasting for a few seconds, and returning in 15 to 45 minutes, also worse at night. With these, flexion of the thigh and leg. Neuralgia, over the left eye, in character much similar to the leg pains. The sensation on walking that a nail penetrated the heel, constant. For five years, paresthesia, and anesthesia of region around the left eye, left face, left temporal region, legs, arms and hands; these felt as if larger and objects felt as if of larger size and as if they had increased in weight. For three years persistent and very troublesome lachrymation. Feels as if he could not close left eye. Loss of memory. Difficulty in speech and at times entirely unable to articulate; at others,

only imperfectly, stuttering and stammering occasionally. Diarrhea for two years. Progressive weakness. Insomnia. Vertigo to the point of falling. Fever; 100 to 102, particularly at night.

PAST HISTORY: Had never had a disease of importance, including the ordinary diseases of childhood. Chancre several years ago—but no secondaries.

PHYSICAL EXAMINATION: A moderately well developed Mexican male, 135 lbs. weight, 5 feet 4 inches. Legophthalmos of left eye with lachrymation in same; obliteration of the folds of skin left face, suggestive of facial paresis, *paraesthesia around left eye*. Nose, throat, ears negative, chest and abdomen negative. Glandular system negative.

NERVOUS SYSTEM: Exaggeration of deep tendon reflexes: patellar, achilles, biceps, supinator longus. Skin reflexes negative. Rhomberg positive; ataxia, incoordination of movements, no tenderness of muscles masses; no change in temperature sense. Blood picture shows nothing abnormal. Urine negative. Wassermann on blood three plus.

DIAGNOSIS: Syphilis of the nervous system.

*Read before the joint meeting of the Medical & Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society at Phoenix, Ariz., December 1-3, 1921.

TREATMENT: Intensive antiluetic: 10 injections of neoarsphenamine; daily inunctions of Mercurial Ointment (4 grms.) 15 in number, alternating; potassium iodide in 60 gr. doses 3 times a day were given in a period of 4 months. This resulted in disappearance of fever, paraesthesia, pains, diarrhea, ataxia, vertigo, and speech defect, in gain of weight; but persistence of lachrymation. The patient disappeared from observation from January, 1920, until June 1921, when he came with the following history:

CHIEF COMPLAINTS: Pains and aches, eruption, paraesthesia, lachrymation and fever. Had been well until November, 1920, when the lachrymation of the left eye became worse, the paraesthesia around same increased, and soon a raised patch around the eye developed; he began to lose his eye lashes, brows, mustache, hair; an eruption began to appear over the body; paraesthesia and anesthesia appeared connected with the eruption, particularly the type of eruption not raised; pains now were aches, also throughout the body; but never sharp or paroxysmal; hands, which had resumed the normal feeling, again felt larger; the fever returned, particularly at night, and would range between 100 and 103; lachrymation was worse, being now almost a constant stream. All these symptoms became progressively worse, until he presented himself again on the 25th of June, 1921.

PHYSICAL EXAMINATION: The facial expression of patient had changed. One would not recognize the same individual. The hair of eyebrows, lashes, mustache, and beard had fallen; an eruption, of a violaceous color, raised 3 or 4 mm. over the level of the skin, in thick folds, *anesthetic*, extended over the face, beginning over the left temporal region, to the right of forehead, nose, cheek, lips, mouth, neck and back and around to the left ear. Lachrymation was marked. Tears would flow in an almost constant stream from the left eye. Right negative. Examination of internal organs showed nothing abnormal. An eruption of two types cov-

ered the body of the patient:

(1). Papular and tubercular, of a violet reddish color, distributed irregularly over neck, body, arms, and legs, forming circles 2 to 5 mm. in diameter, to patches 3x5 cms. Some of these areas were hyperesthetic, others paraesthetic, and still others anesthetic.

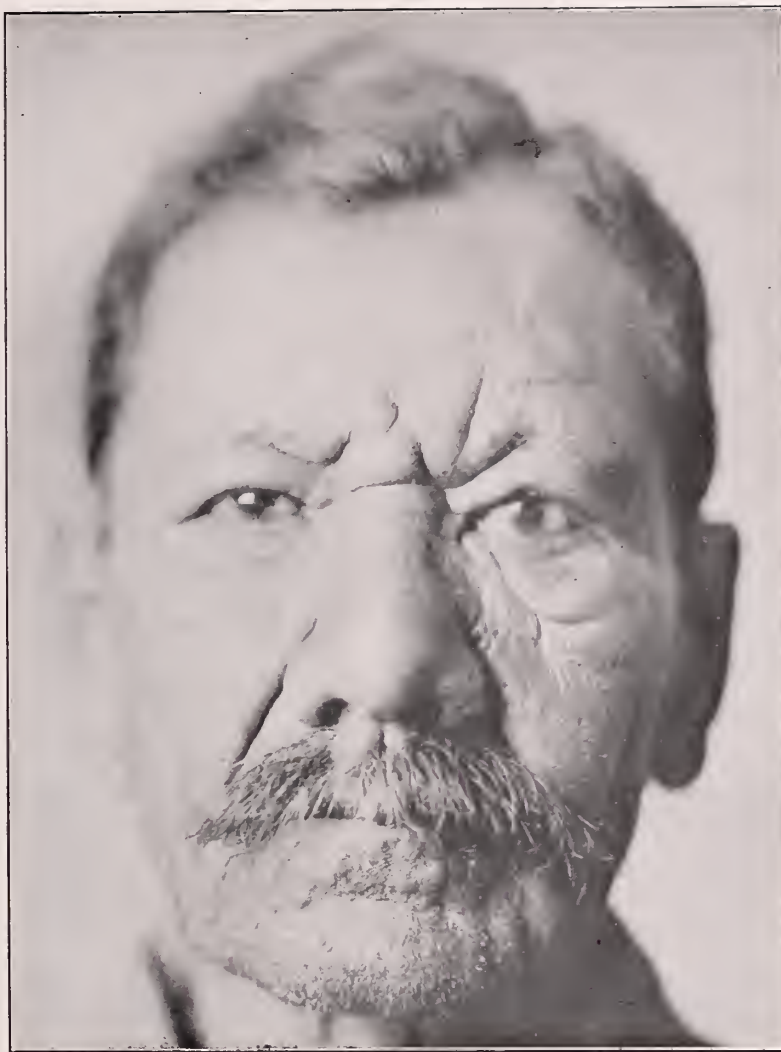
(2). A macular eruption presenting light colored areas, in irregular form. These were markedly irregular areas, bound by a light brown zone of 2-3 m.m. in width with a dark brown outer zone of 5-7 m.m. wide. These were distributed over the body, but most noticeable on the back, nates, and thighs; irregularly alternating with the papulo-tubercular eruption, and completely anesthetic.

NERVOUS SYSTEM: Exaggeration of all deep tendon reflexes, absence of skin reflexes and of the reflexes of defense; positive Rhomberg; ataxia. Blood picture and urine showed nothing abnormal. Wassermann one plus.

TENTATIVE DIAGNOSIS: Leprosy.

A piece of tissue was removed from the neck from one of the patches of the papulo-tubercular eruption, and microscopic examination showed this virtually loaded with the *Bacillus of Lep- ra*.

Before the diagnosis was settled Chaulmoogra Oil had been administered, intramuscularly twice a week, beginning with 1 c.c. and soon increasing to 2 c.c., and once to 4 c.c. A short time after the beginning of treatment the fever, lachrymation, pains and aches disappeared almost completely and soon thereafter the papulo-tubercular eruption of the face became of a more natural color; the skin seemed to recover its natural elasticity and resumed its normal folds, and with that disappeared, too, the paraesthesia and anesthesia. The distinct color zones of the macular eruptions and the clear colored internal spots assumed more and more the natural color of the skin, until at present one does not find on examination, the macular eruptions and only vestiges of the papulo-tubercular. The anesthesia of the macular



Photograph of case of Leprosy, showing the skin lesions of the face and forehead.

zones has also disappeared. The dose of 1 c.c. of Chaulmoogra Oil produced *no* reaction, but, following the increase of dosage from 1 to 2 c.c., the patient noticed a so called reaction, evidenced in fever (100 to 102) and malaise and after the increase from 2 to 4 c.c. fever 103 to 104 for several days, with anorexia, vomiting, diarrhea, nervous irritability, diminution in the quantity of urine eliminated in 3 or 4 days, and an occasional syncope during this time. At no time has there been a paroxysm of coughing after an injection, as re-

ported in the Leprosarium in Hawaii. An effort to secure the Ethyl Esters of Chaulmoogra Oil proved unsuccessful until recently. Of recent years, it has been proven by McCoy, Dean, and others connected with the U. S. Public Health Service that the fractionation of Chaulmoogra Oil and the mixed Esters of the fatty acids of the oil are the "so-called" active principle of the drug. This product may be obtained in small amounts from Leprosarium in Hawaii, with permission of the Surgeon General and is marketed by the Winthrop

Chemical Company of New York and Borroughs Wellcome Company of London. The Ethyl Esters are administered by mouth and intramuscularly in doses from 1 to 5 c.c.

There are several notes of interest in connection with the case reported above: Was the first diagnosis of syphilis of the nervous system correct?

In favour of it are:

- a—History of infection and no treatment.
- b—Clinical findings.
- c—Positive Wassermann.
- d—Marked improvement on anti-leptic treatment.

Against it are:

- a—The fact that the Wassermann is positive in 70% of lepers, (Statistics of Meier) (Lepra Biblio-International Bd. II 340)
- b—The long incubating period and slow progress of the disease.
- c—The clinical findings; and in these, of most importance the eruption, and its anesthetic characteristics.
- d—The findings, on sections, of the bacillus of lepra.
- e—Its rapid and successful treatment with Chaulmoogra Oil.

Are two conditions associated in the same individual, at the same time? Is he suffering from both syphilis of the nervous system and leprosy? Against this question is the rapid improvement which followed the administration of Chaulmoogra Oil, leaving no symptoms resembling syphilis of the nervous system.

IN CONCLUSION:

- 1—Leprosy is a rare but not uncommon disease, particularly in this section of the country.
- 2—It may present itself under peculiar forms, masking, in its pleomorphism, diseases by far more common, and, on that account, pass unnoticed.
- 3—The fact that the Wassermann is positive in 70% of lepers, is confusing for leprosy and syphilis, and proves that the only positive diagnosis of leprosy is made by demonstrating microscopically the Bacillus of Lep-
ra.
- 4—In regard to its treatment: Chaulmoogra Oil and the mixed Esters of the fatty acids of the same oil are specific.

THE ACTION OF RADIATION ON TONSILLAR AND HYPERTROPHIED LYMPHOID TISSUES*

ALBERT SOILAND, M. D., F. A. C. P., Los Angeles, Calif.

To Witherbee, of New York, all credit is due for his pioneer work with x-radiation in the treatment of diseased tonsillar and associated lymphoid structures. He has already reported several hundred cases carried to a successful termination, and his results are now

being verified by other radiologists. As a matter of fact, when we stop to think of the primary influence of radiation upon embryonic and lymphoid cells, it is remarkable that no one began the use of x-ray for tonsillar and adenoid disease years ago.

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Immediately after hearing Witherbee's report, I began to look into the throats of patients who previously had received radiation in my hands for other conditions of the throat and neck, principally cervical adenitis and goitre. In these post radiation cases examined, I have failed to find a single one which showed any pathological enlargement or other signs of an active or potentially infectious tonsil. The picture presented by these patients has been almost invariably that of a smooth mucous membrane over a retracted tonsillar base. The significance of these x-ray tonsillectomies, if such a term be permissible, is of more than ordinary interest, in that they open up another field of radiation possibilities, and add further evidence that radiation is one of the strongest arms of medical science, one that merits the closest study and development by all progressive medical men.

The bulk of the work so far recorded, from those who have treated a sufficient number of tonsillar conditions, has been with the x-ray, but there is no reason why radium cannot be used with has been with the x-ray, but there is no reason why radium cannot be used with equal success. While I have personally been subjecting to x-rays those tonsil cases that have been referred to me in the past eighteen months, I selected six additional patients, all with hypertrophied and pathologically functioning tonsils, whom I have treated with radium. In these cases, the offending tissues were obliterated in the same manner as with the x-ray and in approximately the same length of time.

In my x-ray series, including to date twenty-three patients, the majority have been subjected to the technic suggested by Witherbee. A few, however, were purposely exposed to more intense x-radiation to observe if any variance in the effect could be detected. It does not seem to make very much difference in the patients so far treated, except that the time factors are somewhat in favor of the latter.

Among radiologists a spirited discussion has been started as to what quality

of rays are best adapted to this work. Apparently it makes little difference in the end results. An application through heavy filter does not destroy the tonsil tissue as quickly as an equal amount of radiation passed through a lighter filter. Ullmann, of Santa Barbara, has demonstrated by microscopic study that the tonsil becomes sterile with equal rapidity, irrespective of density of filter, but he also notes that the heavier the filter employed the more slowly the tonsil tissue disintegrates. In my own series, so far no attempt has been made to treat children, although there is no reason for limiting the work to adults. In fact, it is in children especially that this work seems indicated, and it must be apparent to all that when the public learns that radiation can safely destroy the offending tonsil, this method is destined to become popular.

It is quite natural to infer that the throat surgeon will more or less vigorously resent the entry of radiation into his own territory, and, in all fairness to him, it is not the intent of the writer to take away the fruit of his efforts after years of precedence, for he has placed the science of throat surgery upon a plane which is second to none in medical and surgical arts. He is destined to continue in his work until he can become convinced, if the test of time shows, that radiation in this line of pathology offers curative results more easily secured than by operation.

It is by no means yet positively established that all tonsil conditions will yield equally well to radiation. Here the same requirements will be demanded: namely, a sufficiently large group of cases must be subjected to the treatment and sufficient time must be allowed to elapse in order to be sure of the end results before any definite comparison can be permitted.

Judging from reports of cases already quoted and also from personal study, there can be no question as to the ability of radiation to destroy the immediate offending lymphoid tissues. The whole matter resolves itself into a question of personal ability and judgment in prescribing the correct dosage factors indicated. As is true of other

conditions, we must remember that we can easily lay down a definite technic or dose formula, but this can only be along general lines, and the same care in selecting the individual dose is just as urgent as in laying out a lethal dose for a malignant condition.

As has already been pointed out by Witherbee and others, it is of considerable importance to avoid the parotid gland, by keeping this organ completely out of the field when exposing the tonsil region. If this is not done, susceptible individuals may have an acute swelling akin to the mumps. Other than this detail, contra indication to radiation for tonsillar disease has not been observed.

The applied dosage is comparatively smaller than that required in other conditions responsive to radiation. In fact, the exposure need never be carried to a point where there is the slightest disturbing action upon the contiguous or surrounding tissues. This may be emphasized by stating that the changes adduced in all adventitious lymphoid structures of the throat are so definite and can be so readily visualized that one need feel no hesitancy in recommending radiation in this field.

For a standard technic, Witherbee recommends a seven-inch gap, ten-inch distance, three millimeters aluminum filter, five milliamperes on the tube circuit, and four minutes exposure. These exposures are given two weeks apart, until a total of from six to eight have been applied. My own procedure varies slightly from this, in that we use a somewhat higher group factor, and give a little longer time exposure. No particular advantage is claimed for this, except that we obtain the results in a little less time.

A word concerning the use of radiation in malignancies and other conditions. I have stated on former occasions that I do not believe x-rays and radium will be the future cure for cancer. I believe, however, that when combined with intelligent surgery that they are still our best weapons for defense in this terrible affliction. I do believe further that in diseases of metabolism and perverted glandular function, we are to find our future outlet for radiation therapy.

In conclusion, the writer feels that we are yet only at the threshold of the future possibilities of this potent force.

A NEW AND ADVANCED SURGICAL TREATMENT OF BREAST CANCER*

J. F. PERCY, M. D., San Diego, California.

Within the year a statement has been published that the limit of surgical technic in carcinoma of the breast has been reached, and because of this, nothing further could be hoped for in the way of improvement in the statistics of breast operations for cancer.

In this paper I want to add five new

and additional steps to the technic of breast operations, that will, I am sure, improve very materially the present day statistics of this operation.

First: The use only of the hot knife in the removal of breast carcinoma, including a complete dissection of the axilla, and, if necessary, of the neck.

FOOTNOTE: This paper, in substantially the same form has been published in Surgery, Gynecology and Obstetrics, for October, 1921, and the illustrations were loaned us by that publication, to accompany the article in the journal.

Second: That no attempt be made to preserve or secure skin flaps.

Third: That the skin around the denuded area after the removal of the breast and axillary glands be undermined from two to four inches with the cautery knife.

Fourth: In the after treatment, besides the use of Dakins solution, that the arm on the operated side be maintained in an elevated position with the forearm resting on the top of the head, until the surface denuded by the hot knife is practically entirely covered with new skin.

Fifth: That vigorous, daily massage and forcible movement of the skin and arm adjacent to the denuded area be instituted as soon as granulations have commenced to appear.

The balance of this paper will be devoted to the discussion of these five procedures.

Rodman, in his book on Cancer of the Breast, makes the statement that if the cases are seen early the modern operation with the cold steel knife, in trained hands, should give a 50% immunity from return, local or general, for a period of five years or over. I have not had time to look up the percentage of local recurrences in cancer of the breast. Based on my own experience, however, I am assuming that generally it is high. All of the recurring cases that are sent to me for re-operation with the cautery knife had their primary surgery done with the cold knife.

It is not necessary to discuss with you the need for improving our operative results in the treatment of cancer, breast or otherwise. The efforts made by surgeons in the past to prevent local recurrences, following operations for this disease, is a most fascinating chapter in the progress of the surgical art. The outstanding thing has been the constantly increasing endeavor to cut wide of the disease. Our English confreres deserve an immense amount of credit for the clear-headed way in which they have not only demonstrated the extent of the local problem in cancer, beginning with Benjamin Bell in 1804, but because they have also, based on their

investigations, met it by the operations devised in that country to improve their results.

It is no part of this paper to dwell on the question of diagnosis, except to urge that an examination of the thorax be made in every case. This is especially important if the breast is fixed to the chest wall. But I want to emphasize here that fixation alone is no contra-indication to obtaining a successful result by a cautery knife dissection and amputation of the breast. Just how curable this type of case may be, following this use of the heat technic, I have not had a sufficient number of cases to determine. No breast case is inoperable with the cautery that has not yet developed palpable spinal cord lesions or metastases into the upper abdomen, a bone involvement, or a carcinoma en cuirasse. One of my cases developed a recurrence in the lung six years after a Halstead operation with the knife. When this condition was recognized, I gave massive doses of x-ray almost recklessly, because of the seeming hopelessness of the outlook. The result was severe and extensive burns anteriorly and posteriorly. These were subsequently skin grafted successfully and the woman is still alive and well nine years after the use of the x-ray, or 15 years and 6 months following her primary Halstead operation. If this woman had been abandoned to her fate and not been given the benefit of the x-ray treatments to combat the recurrence in her lung, a fatal termination undoubtedly would have resulted long ago.

The point that I want to make is that if the cancer, in its progress, has not already upset vital physiological functions in the patient to a degree that is evidently hopeless, she should be given the benefit of cautery knife surgery regardless of how extensive the primary mass of cancer itself has become.

The inoperable case of cancer is so hopeless that its consideration from the standpoint of treatment places it outside the realm where ordinary surgical judgment can rule or guide us. It is in this class of cases that the cautery knife often gives its most beneficent results.

The outstanding fact regarding cancer everywhere in the body is its vicious tendency to easy dissemination. Were it not for this supreme fact the cancer question would be robbed of its chief importance. The cold steel knife does nothing to circumvent this easy characteristic of the disease. And this applies practically as far as cold surgery is concerned to the early as well as the late case.

The unheated knife does not devitalize any of the malignancy it does not remove. *The hot knife does.*

The cold knife does not spoil the soil for the further development of cancer. *The hot knife does.*



Fig 2. Showing incision with cautery knife cutting from within outward.

The cold knife, if it touches cancer, vaccinates it into new areas. *The hot knife does not.*

The cold knife stimulates the growth of the unremoved cancer cells. *With the hot knife this is impossible.*

It is these failures of ours, after the use of the knife, to prevent the recurrence of cancer, at least in the operative field, that has disheartened the public as to our ability to do anything with it except to give it unhindered permission to commence again.

The actual technic of the use of the hot knife in cancer has for its main purpose the wide removal of the proximate lymphatics with their load of malignant cells and the destruction of the distant ones by the dissemination of the heat as far as it is possible to make it go. It is for this reason that I do not strive for flaps. The skin that is required to make them is too intimately connected with the primary growth. We have no way of knowing whether they contain cancer cells or not, and too often we learn, when it is too late, that they did. In addition to this, my work has conclusively demonstrated that they are not needed. If the resulting hyperplastic granular mass which nature puts



Fig. 1. Incision is first lightly outlined on skin with cautery tip and then started by thrusting it through the elevated skin into subcutaneous fat and continued by following the outline. Always cut from within outward with the cautery knife. A less extensive excision may be considered desirable with the formation of flaps which permit of closure in early cases and where the growth is small and moveable. Note relation of incision to cephalic vein.



Fig. 3. Incision of the skin completed. The cauterizing knife is made to loosen up and infiltrate with heat the structures between the fascia and skin from 2 to 4 inches all around the primary incision. Care should be taken to preserve the cephalic vein between the pectoralis major and deltoid muscles.

in their place is properly manipulated, *i. e.*, massaged, a new skin, which is a remarkably good substitute for the original, develops. Without flaps the cauterizing knife destroys an immense number of malignant cells just from its minor or surface application. To get this result does not require a high temperature, one sufficient to melt fat being all that is necessary. "The balance in cancer is easily upset," and it is more vulnerable to heat than to any other known agent used for its destruction. Without flaps, if a local recurrence develops, all that is required to destroy it is the application of a four per cent solution of cocaine and the re-application of the heat of a heating iron for a few minutes. But I hasten to add that I have never used the heating iron or cocaine in this way because I have yet to see a local recurrence of this nature,

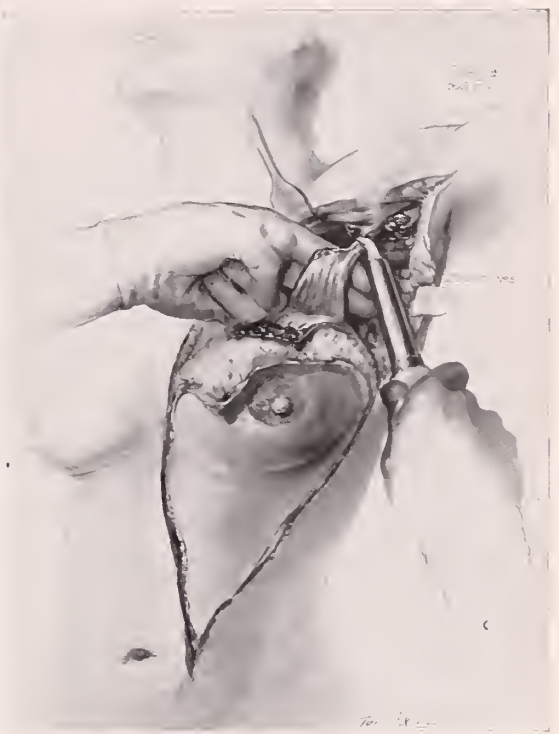


Fig. 4. Dividing the pectoralis major. Exposure of the axilla with the cauterizing knife is no different than other surgical methods in this region except that the hot knife is used throughout. It is important in dissecting the axilla to keep the fingers of the free hand near the cauterizing tip. In this way one lessens the danger of getting careless in overapplying the heat to the blood vessels and brachial plexus.

following the use of the cauterizing knife without the formation of flaps. In other words, the surface of the body denuded of its skin by the cauterizing knife, because of cancer, is left in a condition which is not favorable for the re-development of the disease.

The third important part of this technic, aside from that already emphasized, *viz.*, the use of the hot knife and no flaps, is the important one of undermining the skin with the cauterizing knife around the circumference of the denuded area. This has for its only purpose, not the formation of flaps but the destruction of lymphatics and the annihilation of their potential load of malignant cells. This undermining is especially important toward the clavicle because the major chain of its lymphatics is connected with those from



Fig. 5. Removal of the axillary gland-bearing fascia. The small vessels running into this mass are severed with the cautery knife and ligated with No. 1 catgut. After this dissection the entire breast is removed with the cautery from the chest wall by separating the pectoral muscles and skin from the ribs. Any pathologically infiltrated or adherent areas are gone over again and are thoroughly heated after the removal of the gross mass. The heating iron is also passed slowly over the intercostal muscles.

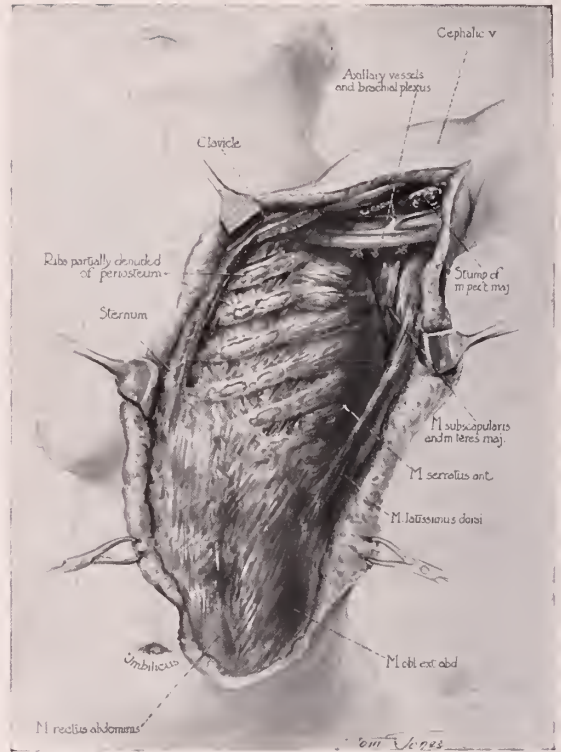


Fig. 6. The completed dissection. This is done with the cautery knife only. The edges of the wound are extensively mobilized, the brachial and axillary vessels are dissected free with the hot knife leaving them absolutely clean and cancer free. The heat is thoroughly spilled into the apex of the axilla and also over the fascial coverings of the rectus muscle down to and including the umbilical region. A temperature sufficient to melt fat is usually all that is required in these regions. As a last procedure the cautery shank is slowly passed over the intercostal muscles. This accounts for some of the destruction of the rib periosteum shown in the illustration.

the axilla. Next, across the sternum, especially at the second and sixth interspaces where the lymphatics dip down into the chest. If this undermining of the skin is so complete as to involve the sternal border of the opposite breast, the practical results in the way of a lessened chance of a recurrence will be increased. And then the hot knife should be very thoroughly and extensively passed downward over the fascia covering the upper part of the rectus muscle, toward the umbilicus. This was the region pointed out by Handley of England in 1904, as one where the permeation of cancer cells

was especially dangerous. He taught that a large number of the malignant infections of the liver occur as the result of metastases through this chain of lymphatics. Finally, the skin should be loosened and the fat between it and the fascial coverings of the external oblique and the latissimus dorsi, up to and involving the scapula, melted and even made to boil. This will loosen a long strip of skin posteriorly which will drop down on to the operating table because there is nothing to hold it. It is held in place at the final dressing, however, by heavy wire hooked into the edges of

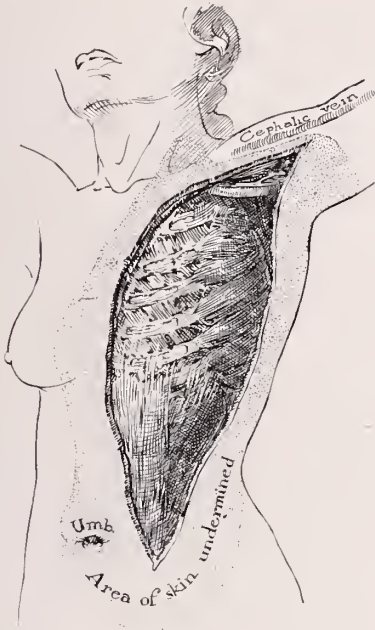


Fig. 7. Diagram showing approximate extent of undermining a skin for the dissemination of heat.

the skin on each side of the denuded space. A practical point is not to permit the hot fat to run down over the normal skin as it produces an annoying superficial burn.

The two remaining steps of the technic that are new refer to the post-operative care of the patient. If the arm on the operated side is kept closely approximated to the side of the head and the forearm turned over the top of the head and fastened there, the patient will obtain the maximum of comfort. I have experimented with many different forms of apparatus and methods to maintain this position of the arm, but have found none so satisfactory or efficient as the simple placing of a clove hitch around the wrist and tying the other end of the bandage around the opposite shoulder. As far as I know this position is original with this operation. It has many things to commend it.

(1) It is more comfortable than when the forearm is placed upon the chest, and the arm rigidly bound to the side of the thorax.



Fig. 8. The completed operation. The skin edges are hooked on to No. 14 copper wire (English standard), protected at intervals by sections of split rubber tubing, the arm is kept constantly over the head except when the wound is dressed. A rubber dam drain is placed below and at the back. The first dressing is made in three or four days and narrow rubber tissue strips are then applied across the wound at inch intervals. Dakin's or Eusoi solution is applied after the first dressing until granulations appear, then dichloramine-T is substituted. The arm is maintained in the position indicated by a "clove hitch" and fastened around the opposite shoulder by a rather ample or thick gauze bandage.

(2) Most important, it requires the natural reparative powers of the body to supply a sufficient amount of new skin to permit of the final maximum normal movements of the arm. It is comparatively easy to get the arm down after being in this position, if necessary, for weeks or months; but it is almost impossible, as you all know, to get it up if the healing process has occurred while the arm was down.

(3) The chances for the development of a lymphangitis and edema from cicatricial occlusion of the axillary vessels are greatly lessened. In fact, I have had no presentment of this condition in any case where this position has been strictly maintained until the wound was completely covered with new skin.



Fig. 9. This patient had previously been treated with cancer paste. Metastasis into the skin and axilla were extensive. Absolute fixation of breast. Maximum abduction of arm is shown. (Edema of forearm and hand.

The fifth requirement in the after-treatment, following the extensive removal of supposedly infected cancer involved tissues, concerns the employment of active and vigorous movement of the edges of the wound circumference. The skin surrounding the area that has been removed should be pushed inward or toward the denuded space firmly and persistently at least once each day. Failure to do this permits the development of pale, grayish looking, easily bleeding, infected and, therefore, unhealthy, granulations that will not cover with epithelium. But active, progressive, even forcible movement of the skin, as soon as the granulations are in evidence, encourages the development of a blood supply that initiates the growth of a new epithelial covering in a most remarkable way. With this there is a disappearance of the infected granula-



Fig. 10. Same patient as in Figure 9. Arm overhead. Caustery dissection extending into opposite breast. The sternum, scapula, latissimus dorsi, upper half of external oblique, axillary vessels, and brachial plexus are all exposed. The ribs are partially denuded of periosteum. Absolute mobility of all structures forming the whole extent of the wound. This picture was taken at the time of the first dressing, 4 days after the operation. No pain or temperature at any time.

tions. Curiously enough, the development of the new skin covering is not alone from the edges of the wound, but often it springs up after two or three weeks of this persistent manual movement of the skin edges, all over the denuded and excavated space. At first it looks as if small, isolated patches of frost were appearing—with the difference that they are less white than frost. These changes when they begin to show, expand rapidly, and within 48 to 72 hours, there is no doubt as to what they are. But this epithelization never develops while the unhealthy, bleeding, secreting granulations, described above, still persist. These are always an un-failing evidence that the massage and



Fig. 11. Showing the movability of the new skin following an extensive cautery dissection in an advanced breast carcinoma, November, 1914. In this patient flaps were made for the upper part of the wound with the cautery and applied over the axilla. Movement of the arm was practically normal in a year following the operation.

movement of the normal skin surrounding the operated field has been insufficient to make the necessary healthy changes required for the progressive increases of the new skin. The phenomena here described, of the development of this skin covering, following this method of management, is so remarkable as almost, if not quite, to es-

tablish a new principle in the surgical healing of large wound surfaces. The skin that results from this procedure or treatment is more normal in appearance and, therefore, much more efficient than any that can be obtained by the so-called Thiersch grafts. The latter, when planted on these large areas of denuded surface, remain firmly attached to the underlying surfaces, and as such easily break down because too often they are too fragile to serve well as a normal skin covering. At each daily dressing of the wound, the whole arm is actively moved and massaged from the tips of the fingers to the shoulder. There is a remarkable absence of pain or temperature following this operation, either in the region involved in the treatment by the cautery knife or when the arm is moved at the wrist, elbow or shoulder. The administration of even a small dose of morphine is almost never required. It is true that it requires a longer time for one of these patients in the hospital than when the wound is covered by skin flaps at the primary operation. But you can always have the satisfaction of knowing that in your cautery wound you have left no active cancer cells for the production of a subsequent recurrence of the disease. More than this, if distant metastases have not already taken place, you can not fail to have a better final operative result than has so far been possible by any other method.

IS A DIAGNOSIS OF NEURASTHENIA EVER JUSTIFIABLE?*

DR. M. K. WYLDER, *Albuquerque, N. M.*

Neurasthenia is defined as a "disease without physical foundation." I sometimes feel that a man who makes a diagnosis of neurasthenia with great frequency should be put in a class with the doctor who, after examining a negro who was suffering from cancer of the pancreas and who was extremely emaciated, on being asked for his diagnosis, answered that this man was suffering from Cachexia Africano.

A careful study of the cases that have been diagnosed as neurasthenia will develop or bring out some of the underlying conditions that are causes of these so-called neurasthenic symptoms. With your kind permission, I would like to give the important points of a few cases that have been called neurasthenia.

The first, a woman who had been overcome with heat while visiting in the East and, from that time, had lost strength but not weight; was unable to sit up for more than a hour without feeling exhaustion, headaches, nervousness, and stomach symptoms; could not see people without getting nervous and exhausted; frequently vomiting; suffered from heat in summer and cold in winter. Test meal showed contents normal; hemoglobin normal; blood count practically normal; Wassermann negative; urine often showed traces of albumin, at other times none, usually contained pus. On catheterizing, found right kidney normal, pus came from left. After a nephrectomy, she is leading practically a normal life.

Second case was a young man of 35, who came in saying he had lost his pep, was always tired; suffered with pains in back, especially on lying down; at times slept in a chair, rested poorly; had no appetite, was distressed after eating. He had taken a month's vacation before coming for treatment; returned from vacation feeling worse than when he left; was beginning to

lose confidence in himself; had no abnormal temperature, at least when I saw him; Wassermann negative. On examination a slight nodule on left testicle which gave practically no tenderness on pressure; this nodule increased in size; at times he found his temperature 99 to 99.4. Being unable to find other cause for a run-down condition, testicle was examined and removed; was found to be tuberculous. His condition began to improve almost immediately. He is back at work, gaining both weight and strength and no longer feels he is neurasthenic.

A young man of 28 whose only complaint was that he couldn't apply himself; at least effort became exhausted, his legs gave out and he had to sit down, was beginning to worry over his condition. Several physicians had told him they could not find anything wrong with him and one had advised him to brace up and be a man, but had given him no bracer. Heart and blood pressure normal, also lungs and kidneys, no stomach symptoms, no headache, slept well but got up tired, Wassermann negative but remembering the old axiom, "When in doubt, give iodides," he was put on vigorous anti-leucic treatment, neosalvarsan in the vein and potassium iodide by mouth, mercury intramuscularly. In one month he was working at his trade, that of a painter and again believes in himself. He has since told me that he had decided that if this last trial didn't help him he would suicide.

Another youth of 20 sent to New Mexico on account of tuberculosis, which he did not have; had lost no weight, was very nervous, had a rapid pulse, had lost strength, endurance and ambition, was brooding over his condition; he had been told to go into a sanatorium for nervous diseases, that he was a neurasthenic and he was beginning to believe it himself. His pulse was running 110 to 120, slight enlarge-

*Read before the joint meeting of the Medical & Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society at Phoenix, Ariz., December 1-3, 1921.

ment of the thyroid; on close examination the tonsils were found to be diseased; he was advised, before attacking the thyroid, to have tonsils attended to and that this might be the underlying cause that was stimulating his thyroid; which proved to be the case. He returned to his home, East St. Louis, and has since written me that he is all right.

We all come in contact with such cases as these, especially of the young of the neurotic type. They are difficult, sometimes impossible, of diagnosis. They complain of long trains of symptoms chiefly mental and physical nervousness and weakness. They may be suffering from toxic thyroids, some of them are early cases of tuberculosis, others may be caused by tonsils or other focal infections, diseased gall-bladder; seldom the appendix, for the appendix is all too frequently attacked without being given his constitutional right of a fair and impartial trial but is convicted too frequently on hear-say testimony without a hearing.

Is there not then some physical cause

for all these cases? And is it not possible that neurasthenia is not a disease, but a symptom,—the indication of a diseased body?

In many of these cases, however, after making as complete a search as I knew how to make, I have failed to find a physical defect to explain the condition. Just at present we are hoping for great things from the endocrines, but as Dr. Cushing so ably put it, up to the present the Cortezes and Pizarros are here but the real discoverers, the Balboas and Magellans have not arrived.

I believe, however, that all of us use the endocrines more or less, some surreptitiously, some openly, and some experimentally. In conclusion, permit me to say that it is my belief that if we will but study our cases, using all the means at our command, that the diagnosis of neurasthenia will be made with much less frequency and that I believe the diagnosis of neurasthenia is often an excuse for laziness and a cloak for ignorance.

THE PHENOL-PETROLATUM TREATMENT FOR TUBERCULOSIS

DR. S. S. WARREN, Mescalero Indian Reservation, Deming, N. M.

To quote from Fishberg: "We have no specific botanical, chemical or physical agent which, when administered to a consumptive, will exert a selective action on the tubercle bacilli, as mercury and salvarsan do on the spirochetæ of syphilis, and quinine on the malarial parasite. Nor have we a therapeutic agent which will enhance the resistance of the tissues against the ravages of the sclerosis of the affected area."

Nature, however, has the power and demonstrates this power by curing probably ninety-five percent of all tubercle infections, for we have definitely proven by autopsy and other pathological studies that ninety-nine out of every hundred, born of woman, has, at some time, had a tubercle lesion.

Why, then, does nature withhold from

us her secret or—does she? As paradoxical as it may sound her secret is not a secret and has been known to us since Metchnikoff gave us the theory of leukocytosis. Why has nature been so successful and we so impotent in our efforts to imitate her in this simple physiological phenomenon of bringing into action her innumerable forces of leucocytes the moment any pathological or foreign invasion interferes with the physiological phenomena of health? The moment that we introduce a serum, an antitoxin, a botanical, chemical or physical agent underneath the skin she resents it and within the time of a few heart beats she has her first line of defenses thrown around the needle prick and is following up every atom of foreign substance that we have thrown into her lymphat-

ics. If this be tuberculin you get a local, and a general febrile reaction; and if be a splinter you get a local reaction, and in time fever, if the splinter carries with it any infection. Why did the physicians and surgeons, in the old days, use a seton in lung fever—frequently with good results? Because they produced a local and general leucocytosis, the same phenomena that we get today when we use a serum or antitoxin.

Baldwin tells us that he can produce elevation of temperature, malaise, backache, nausea, etc., and even the local reaction by the injection of any foreign protein into a tuberculous person. Neither the local nor general reaction is absolutely specific. Cinnamic acid, cantharidin, pilocarpin and other alkaloids produce it, which is merely the registration of nature's protest against this imposition. In truth it is but a natural protest and not a response indicative of any pathological change due to a disease.

Why does nature make so many cures and fail to cure all? First: She makes her diagnosis days, months and perhaps years before the faintest sign or symptom would be discernible or apparent to the cleverest diagnostician with all of his modern aids to diagnosis such as the microscope, x-ray and all of our methods of determining and detecting pathological changes. She does not wait, as does the patient, until the sputum is streaked with blood, for the fever, cough and those characteristic symptoms so familiar to us—to begin the fight. Every heart beat since the first focus of infection has thrown down the challenge of this invasion she has been martialing and manouvering her armies of leucocytes for action at the point of infection, guard duty at every weak spot of her citadel and started her blood making organs conscripting and preparing for service her innumerable forces.

In ninety-five percent of these wars against invasion she has her victories and the clinician and physician are never appealed to.

Why does she lose the fight in the greater number of five percent, aided, as we attempt to aid her, by our know-

ledge of modern science and methods?

And there is another secret which she has been trying to tell us which many of us will not see or agree to until we have proven by experience and have the knowledge of results. I have long ago proven this to my own satisfaction and the results which I have obtained lead me to believe that you can do the same.

Years ago, as early as 1830, Reichenbach introduced and prescribed creosote. How many of you who have not at some time prescribed creosote and have noticed the almost immediate benefit and improvement of the patient? Fishberg says: "When administered in proper cases and in proper dosage, it improves the appetite, stimulates digestion and assimilation, improves nutrition, diminishes expectoration, removing at times its disagreeable odor and purulent character. All of which is sufficient of an encouragement to the average sufferer from phthisis to bestow confidence in the physician and to look forward to an ultimate recovery." And then the disappointment to patient and physician when its ill effects begin to show in gastric intolerance and albumen in the urine. Has any treatment ever given us the hopes and the disappointment as has creosote? Yet it is the open sesame and points the way to the greatest aid that we can give nature whereby she can cure the greatest number of that other five percent.

To what is the beneficial action of creosote ascribed? To its power to inhibit the growth and destroy in the gastro-intestinal tract the tubercle bacilli which are inevitably swallowed by every consumptive.

Here, then, is the reason why nature does not cure all pulmonary tuberculosis when there is sufficient resistance and reserve. Where this reserve is below normal we must bring it back to normal, which, after all, is merely a matter of proper hygiene and feeding. *Then we must keep the gastro-intestinal tract free from tubercle bacilli or else render them innocuous and impotent to reinfect or reinoculate.*

Nature does cure or hold in check the initial infection, but she becomes

exhausted in her fight against repeated infection and reinoculation from the constant and persistent, voluntary and involuntary, swallowing of tuberculous sputum and detritus that she must constantly eliminate.

When we are able to protect her absolutely against this source of reinfection and reinoculation she will reward us with a hundred percent of cures, if we see that she gets sufficient nourishment to rebuild her broken down tissues, because all cases that seek treatment sufficiently early will never reach the advanced and hopeless stage.

To control the swallowing of sputum is, as we all know, a hard task but an impressive explanation to the patient and an imperative command will, in a great measure, control it during the waking hours. This involuntary act while sleeping is beyond the control of the patient. This makes it imperative that we find and administer an intestinal antiseptic as potent as creosote and as harmless as water. There is no chemical, there is no drug that will meet this condition. But we can give nature this immunity and protection in one way by using that of which she has given us so generously, a mineral oil, (petroleum). It is a physical barrier only, but one which, when coating a living membrane, is impregnable to the passage of a micro-organism or its toxin.

How do I know this? I know it from my own experience, having used it in my own case for twenty four years. I know it from the fact that mineral oil has an affinity for mucus or the mucus for the oil, so much so that every particle of tuberculous detritus passing along the alimentary tract will become enveloped in oil and thus rendered innocuous. I know it from the fact that a slide taken from the stool of a tuberculous enteritis will, upon microscopic examination, show this to be true. I maintain, therefore, that while the oil of petroleum is unique in the fact that it is mechanical in its action as an antiseptic it will give nature the one protection which she can not give herself, and which is so essential in aiding her in her cures.

In the year 1912, I suggested to the profession the hypodermatic use of a one per cent phenol-petrolatum in the treatment of pulmonary and glandular tuberculosis as I felt that my own experience with it warranted me in bringing it to the attention of others.

At that time I was not administering it by mouth, believing that the only aid which nature required, and calls upon us to give, was a spur or whip to a lagging and losing fight she was frequently called upon to make as the result of the exhaustion of her blood making organs in the advanced cases. I knew from my own experience with its use hypodermatically in daily doses of from one to two c.c. that I obtained and maintained a more persistent and uniform leucocytosis than with any serum or tuberculin I had ever used. And, instead of entailing a breaking down of the natural resistance as I had noted in the use of serums and tuberculin as evidenced by the clinical phenomena of malaise, chills and general exhaustion due to the reabsorption of toxins, there was little if any rise in temperature, no chill, no aggravation of the cough and no cold and clammy skin, but from day to day a steady progress towards a re-establishment of the normal functions of the organs of elimination.

There is a slight reddening and swelling at the point of infection which gives about as much discomfort as the bite of a mosquito. In the thousands of hypodermics that I have given, even in the most advanced and hopeless cases, I have never had an ulceration or infection at the point of injection.

The question most frequently asked me by physicians and occasionally by the patient is: Will the carbolic acid injure the kidneys? My reply to this question, when asked by the physician was:

In giving diphtheria anti-toxin to a little child did you ever consider how much phenol you were injecting? Do you not recall that in this anti-toxin, as in practically all biological products, there is a one-half percent phenol? You are injecting ten times as much into an infant or little child as I inject into an adult.. But this is not all;

phenol-petrolatum as prepared, and in order to hold the carbolic in suspension, must have added a small amount of a vegetable oil and for this purpose we use camphorated olive or cotton seed oil, the camphor completely neutralizing the acid.

But why do you phenolize you petrolatum? This question is frequently asked. For the reason that phenolized petrolatum will give a much higher and more persistent leucocytosis.

Can nature effect a cure in the more advanced cases if we aid her, and protect her from constant reinfection and reinoculation from and through the alimentary canal? In pulmonary tuberculosis, yes, provided, first, that there is no serious involvement of a tuberculous nature of the kidneys, spleen and peritoneum. Second, that no fatal hemorrhage intervenes resulting from gangrene or extensive loss of lung tissue. And finally, if the digestive organs continue to function to the point of furnishing her sufficient nourishment to repair broken down tissue, and to keep up the necessary preponderance of leucocytes. A cure in so far that the case is arrested and will so remain as long as a physiological equilibrium can be maintained.

As to the phenol-petrolatum treatment. What is phenol-petrolatum? As its name implies it is the phenolated mineral oil of petroleum in a half of one percent strength. While it has been prepared for me by two of the well know manufacturing chemists it is not a proprietary preparation. The word is not copyrighted and any chemist is at liberty to dispense it or any physician to use it. The acid is held in suspension by the addition of a small amount of a vegetable oil to which I prefer to add a little camphor. Camphorated olive or cotton seed oil acts very nicely. The dose hypodermatically is from one to two c.c. every second day over a period of six weeks to two months, then a period of rest for three weeks and a repetition of the treatment. I give the hypodermic in the back, subcutaneously, to either side of the spine where it is readily absorbed and taken up by the lymphatics. They give little if any pain but there is a

slight soreness afterwards and it is my practice to use iodine at the point of injection altho there is no danger of an infection as phenol-petrolatum is an antiseptic, but the iodine relieves the soreness. Administration of the half percent by mouth should be three times a day and about half an ounce, preferably before eating. It is also well to give olive oil in conjunction for its food value. In fact, the more olive oil and white bread that the patient takes the better for him.

In regard to diet, let me insist here that I will not treat an advanced case of tuberculosis when the patient insists upon taking raw eggs or raw milk. If there is any combination that will produce more toxins in the alimentary canal than the gangrenous sputum swallowed by an advanced case of tuberculosis with raw eggs and milk in the alimentary tract, I am unable to imagine it.

As to the reason for the hypodermic use of phenol-petrolatum. It is not only conceded, but a proven fact that we do use serums and biological products with good results in acute infectious fevers where the race is to the swift, as in diphtheria, but here we do not parallel nature's way for we conquer by the extravagant expenditure of her reserve. While she is tolerant under these conditions she is intolerant when we attempt to use the same means to fight the slowly progressive, wasting diseases, as tuberculosis and cancer. For here she has the wisdom of infinite time in her knowledge and refuses to exhaust her blood making organs under the continuous prodding of any biological product and does so only under protest, which is apparent to us in the loss of a natural resistance against disease, best designated by the term, "inherited immunity."

Some years ago when the practice of giving typhoid and paratyphoid prophylaxis was so general, and even now so persistently followed in the army, navy and other branches of the service, and also followed to a lesser degree in general practice, I advanced the thought, and at times predicted, that this continuous practice with soldiers would so lower their natural or in-

herent immunity that nature had established against tuberculosis, that under the strain of active service and the exposure incident thereto we would find that many of these men would develop tuberculosis. This practice, to my mind, is unquestionably accountable for the large number of ex-service men having tuberculosis. Many of these men never got beyond the training camps where they had better food, more rigid sanitary and hygienic protection than they had ever enjoyed; and should have left the service enjoying a greater immunity from tuberculosis than any other class.

Phenol-petrolatum when introduced under the skin is taken up by the lymphatics. It is foreign to the system, no less than is a biological, botanical or chemical product and presumably nature handles it by the same methods and eliminates by the same channels, but here the parallel ceases. She does not protest its presence with fever and chills and general lassitude as she does a serum or anti-toxin. She does not register the therapeutic effect as she does from the administration of drugs, botanical and chemical. There is no stimulation or depression, no dilatation or contraction of the pupil nor any of the signs or symptoms so familiar to us when a drug is administered; and only through the aid of the microscope can we determine that she has taken the least notice of this interference.

The leucocyte count goes up; it stays up from day to day and they go into action, not against the artificial, biological stimulus from without but against the toxins from the ever breaking down of infected tissues. They are not called upon to fight serum and infection, which is the point I wish to make, and which I repeat. Nature will, and does, tolerate in an acute infection what she knows only too well will, if persisted in, mean exhaustion to a point of lowered resistance, below safety,

against all infection and this she will not tolerate without making most strenuous protest.

Mineral oil is the one agent which she will tolerate day after day for the reason, I believe, that it does not break down one white blood cell and acts as a stimulus to bring her leucocytes into the superficial blood channels as well as to stimulate the spleen and bone marrow to speed up reproduction. Whether this explanation is correct or not, I believe you will agree with me that this phenomenon is essential for the cure of all wasting diseases.

A good and simple test to determine as to the value of phenol-petrolatum as a therapeutic agent is to give three injections, one daily, in acute coryza or winter cold. Give one c. c. in the arm as an ordinary hypo.

Any physician wishing to give phenol-petrolatum a trial who will write me I will be glad to furnish, gratis, a number of ampules.

Accident to Dr. M. K. Wylder—The many friends of Dr. Wylder, of Albuquerque, President of the Medical & Surgical Association of the Southwest, will regret to learn that he recently suffered a very painful and serious accident. While crossing a railroad track near that city, in making a call, his machine was entirely demolished and the doctor escaped death almost by a miracle. He was bruised from head to foot, had several severe scalp wounds, and one or two fractured ribs. At this time (May 1st), he is rapidly recovering, but has been confined to bed for several weeks.

Dr. Harry Carson Operated—Dr. Harry Carson, of Phoenix,, Secretary of the Medical & Surgical Association of the Southwest, is confined to the Hospital, in the city mentioned, having recently undergone the operation of nephrectomy for a tuberculous kidney. His many friends throughout Arizona and the Southwest generally, are hoping that his recovery will be attended by no more than the incidental delay. So far as could be determined at the time of operation, and since, the other kidney is organically and functionally sound and prognosis should be favorable.

ADVANCE IN THE DIAGNOSIS AND TREATMENT OF THE DISEASES OF THE BILLIARY TRACT*

By F. D. GARRETT, *El Paso, Texas.*

The diagnosis of diseases of the gall bladder, bile ducts, and liver is often difficult. In large clinics where many abdominal cases are operated upon daily, the percentage of tentative diagnoses of biliary disease is large.

The difficulty in the diagnosis of any disease is in direct proportion to the ease with which we can correlate history, symptoms, physical signs, and laboratory findings, with a mental picture which we retain of that disease.

A patient with a history of having typhoid twenty years ago, began to have indigestion, hyperacidity, and gastric flatulence two or three years later. Ten years later he had attacks of pain felt with the greatest intensity in the right hypochondrium and radiating to the back and right shoulder. At times the pain was of hypodermic severity. There were periods of jaundice. Such signs would mean, even to a tyro, a diseased gall bladder and, perhaps, stones.

Unfortunately, the history, the pain and its radiations, local tenderness and jaundice are not always present. One or all of these signs may be absent or, if present, they may be of such an unusual type as to mislead the elect.

That disease of the biliary tract is common, is witnessed by the frequency of operations dealing with these organs, and the yet larger number of unsuspected cases found post-mortem. I believe that in a very large percent of cases of biliary disease, the diseased area itself is silent. My own observations justify the conclusion that much chronic invalidism, including many cases of chronic myocarditis, high blood pressure, pancreatitis, and diabetes, result from infection of the biliary tract. As a source of focal infection it is probably second to none.

There is an early period in every disease in which gross anatomical changes have not taken place. If we would do the patient the greatest good, we must

discover the disease before these changes occur.

Exploratory operations, especially those which do not expose the gall bladder to full view, are entirely inadequate to discover the beginnings of disease. Can a gloved hand, be it ever so practiced, discover an infection characterized, perhaps, only by swelling of the mucosa and increased production of leucocytes and mucus? Even the surgeon must admit that only advanced disease with stones or a contracted or distended gall bladder can be felt.

Our treatment of gall bladder disease has, in the past, dealt with the late, and not with the early, stages of the disease. In the case of our typhoid patient, it would have been better to have recognized and dealt with the primary typhoid or colon bacillus infection, and to have saved the patient from his prolonged digestive disturbance and from serious operation.

Let us briefly review some of the pertinent physiology and anatomy. The liver is a compound tubular gland. It is made up of myriads of small lobules, and each lobule of large polyhedral cells. Each lobule has an independent arterial and venous supply. The bile capillaries, that is the beginning of the bile ducts, run in minute grooves or canals between the tubules of the liver, from which they drain and empty the bile into the interlobular bile ducts. The contents of these interlobular ducts are collected into larger channels, which in turn carry the bile into the right and left hepatic ducts. These unite into a larger one and are joined by the cystic duct. Their union forms a larger or common bile duct which empties the bile into the very beginning of the intestinal tract.

It is of great importance that the terminal bile ducts and the gall bladder have, besides a lining coat of cylindrical and cuboidal epithelium, rather abundant large mucus glands. Their

*Read before the joint meeting of the Medical & Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society at Phoenix, Ariz., December 1-3, 1921.

walls contain abundance of longitudinal and circular smooth muscle fibres.

At the terminal portion of the common duct, in that portion which runs obliquely between the coats of the duodenum, the unstriated muscle coat becomes augmented into a definite sphincter, which Oddi described, and which controls the expulsion of bile into the intestine. The gall bladder also has an elastic coat which is capable of active dilatation and contraction.

Sensory fibres, capable of causing reflex contraction and dilatation, are found both in the vagus and splanchnic nerves.

The gall bladder seems, under normal conditions, to act not only as a storage reservoir for bile during periods when the digestion is not active, but, as shown recently by Rous and McMaster, it absorbs and condenses the liquid from the bile.

It is known that gastric chyme laden with albumoses and peptones, on arriving in the duodenum, causes relaxation of the common duct sphincter and a flow of bile. The products of carbohydrate digestion do not stimulate the bile flow.

Venous blood when brought to the liver has been shown by Adami to be rich in living bacteria. It is one of the important functions of the liver to destroy or eliminate these bacteria. However, under normal conditions, the bile may contain living organisms.

There are two important factors in preventing infection of the biliary system, even though the bile contain living pathogenic micro-organisms. One is the maintenance of normal vitality in the mucous membranes of the gall bladder and bile ducts. Micro-organisms prefer to settle and grow on tissues which have lost their resistance. The other safeguarding factor is the presence of abnormally prolonged stasis of bile in various parts of the biliary system. Of these two factors, the writer believes stasis to be the most important.

Too long intervals between meals and a diet making very irregular demands upon the bile flow would favor stasis. A sedentary occupation, from the attendant lack of exercise, leads to an ac-

cumulation of fat about the abdomen and favors stasis.

Another very important cause of stasis may be due to spastic closure of the sphincter of the common duct. This undoubtedly occurs and may be due to lost balance between the vagus and sympathetic, as in some cases of pylorospasm.

In 1916 Melczer, of the Rockefeller Institute, read a paper on "The Disturbance of the Law of Contrary Innervation as a Pathogenic Factor in Diseases of the Bile Ducts and Gall Bladder." On the basis of experimental work done by him, he recorded in a footnote the following: "I have observed that the local application of a 25% solution of magnesium sulphate upon the mucosa causes a completely local reaction of the intestinal wall. It does not exert such an effect when the salt is administered by mouth, that is, when it has to pass through the stomach before reaching the intestine. The duodenal tube has, however, reached an efficient and practical stage." Continuing, he makes the suggestion "to test, in jaundice and biliary colic, a local application of a 25% solution of magnesium sulphate by means of the duodenal tube." "It may," he says, "relax the sphincter of the common duct and permit the ejection and even removal of a calculus of moderate size wedged in the common duct in front of the papilla of Vater."

Acting upon Melczer's suggestion, in 1916, I treated a case of chronic jaundice of some months standing, by the injection of a 25% solution of magnesium sulphate into the duodenum at intervals, over some time. And though my technic was poor as compared with that in present use, the result was encouraging.

My interest in the work has since been greatly increased by the work of Lyons of Philadelphia. He has done much to put it upon good footing, and we owe to him much of the technic.

After the patient swallows the tube into an empty stomach, a little warm 2% solution of sodium bicarbonate is injected and he is instructed to lie in a right lateral semi-prone position. He is now encouraged to swallow the tube very slowly, to a distance sufficient to

enter the duodenum, and pass some three or four inches below the pylorus. We try to make sure that we are in the duodenum (1) by the change of color of the aspirated fluid which, in most cases, is tinged with yellow; (2) by the change in consistency of the fluid withdrawn, the duodenal fluid being thicker and flowing like thin molasses instead of dropping like water. In case the sphincter of Oddi is closed (and Lyons says that is the normal state when the stomach is empty), we can sometimes still cause a little bile to be expelled by causing the patient to sit up for a moment and then lie down, or sometimes the injection of a little warm normal salt solution may start a flow. After some experience it is usually possible to know when the tube has been placed correctly without having a showing of bile.

Now, upon injection of a 25% solution of magnesium sulphate there follows, under normal conditions, in from three to twenty minutes, a flow of light yellow bile, and this soon changes to a darker yellow color and lower viscosity. The first bile we call, for convenience, after Lyon, "A" bile, the second "B", and the third "C" bile.

With an experience of several hundred duodenal taps, we think that A bile comes mostly from the bile ducts; that B bile comes mostly from the gall bladder; and that C bile comes from the liver. It seems only necessary to prove that B bile comes from the gall bladder. This can be done by comparing the bile removed by medical drainage with that obtained from the gall bladder after it has been removed by operation. Other observers, as well as myself, have found by comparison that the two specimens are identical.

Freshly secreted bile is thin, light yellow, and sometimes greenish in color from oxidation of bilirubin to biliverdin. Bile from the gall bladder is recognized by contrast with the first part of the flow, and is distinctly darker, varying from yellow to dark mahogany.

Just as we get information from examination of the urine, so can we get help from examination of the bile.

(1) The presence of bacteria. By

careful cleansing of the mouth before swallowing the tube, and the stomach after swallowing it, and by using care to avoid contamination of the fluid during and after aspiration, we are able to determine the type of the invading bacteria.

(2) The presence of mucus, in excess. A marked increase in the amount of mucus in B bile denotes irritation or inflammation of the gall bladder or ducts.

(3) The presence of excessive numbers of leucocytes and epithelial cells. Cholecystitis, with or without stones, is denoted by the presence of numerous leucocytes, excessive numbers of typical epithelial cells and increase of mucus. The presence of a large number of leucocytes in the bile denotes a severe infection.

(4) An inorganic sediment. In one case suffering from severe attacks of biliary colic, I found the bile loaded with long sharp crystals. I have also drained away pinhead size concretions, gritty to feel, and of amorphous structure microscopically.

Admitting that the gall bladder can be drained without surgery what types of cases are suited to this kind of treatment? My own experience would lead me to advise medical drainage as of value in the following conditions:

(a) In carrier cases of typhoid or colon bacillus infection. This method, if used early and properly may prevent the development, in such cases, of serious disease.

(b) Gall bladder disease following soon after any acute infectious disease, as influenza, tonsilitis, pneumonia, etc.

(c) In chronic recurring bilious attacks, characterized by nausea, acoria, vomiting, and sometimes migraine.

(d) In cases of chronic jaundice not clearly due to obstruction of the common duct by stone, nor to hepatic cirrhosis, and not accompanied by serious infection of the biliary tract. In Weil's disease.

(e) Following the operation of cholecystotomy there are many cases which fail to get relief. Lyons and others have been able to obtain positive cultures from bile from the gall bladders

of such cases after the drainage fistula had closed. In these cases where symptoms had returned soon after operation, medical drainage over a considerable period of time, along with autogenous vaccines, gave relief.

(f) In cases of mild cholecystitis or choledochitis.

CASE REPORTS

Mrs. H. Aged 55. A chronic invalid from pulmonary tuberculosis. She suffered from obstinate constipation, and had had several attacks of what was thought at first to be intestinal paresis with distention of the abdomen and great pain. About April first she commenced suffering again with severe pain and distention of the abdomen. This was thought by the attending physicians, including myself, at first, to be due to obstipation. However, certain radiations of the pain made me suspicious, and I advised medical drainage for diagnosis. We found increased mucus and turbidity in B bile, and many small flakes made up of leucocytes and epithelial cells from the gall bladder. A bacteriological examination made at that time showed pure culture of *staphylococcus aureus*. We drain the gall bladder three times following this, at intervals of about three days and each time the findings were substantially the same. Drainage had to be omitted for a week. About this time the patient had a chill and a sharp rise of temperature. Because the patient and her family wished to avoid an operation, and her regular attending physicians did not consider her a good risk, we drained the gall bladder again by medical means. The number of leucocytes found in B bile was now greatly increased. A cholecystectomy was done at this time. The gall bladder contained a few stones and bile containing much pus, identical with the bile drained away prior to operation.

Mr. L. Age 32. Past history negative except that at the age of 12 he had an attack of severe dysentery. Following that he was jaundiced. He said that during the past 20 years he could not remember to have been free from jaundice. He complained of indigestion but had no definite attacks of pain. General physical examination, including stomach contents, stool and urine examinations, were negative except for the icterus, and a low gastric acidity. Drainage was advised and was carried out without difficulty. More than 150 c. c. (normal 30 to 90 c. c.) of dark thick gall bladder bile was drained away. There was increase of mucus, but only scattering leucocytes and epithelial cells. Bacterial examination of B bile showed *bacillus pyocyaneus* in pure culture. This patient was under treatment for three weeks and was free from jaundice after the third or fourth day following the first drainage.

Drainage is always followed by 200 to 300 c. c. of hot Ringer's solution containing one-

half drachm of sodium sulphate by the Murphy drip. We are giving this patient an autogenous vaccine prepared from his B bile. We think that this patient has had a mild chronic infection and atony of the gall bladder, and hope that, if his treatment can be kept up for two or three months, his relief will be permanent.

CONCLUSIONS

(1) The gall bladder can be drained by non-surgical means in the cases having some tolerance for the tube, and without obstruction at the pylorus. Some other possible causes for failure are indicated in this paper.

(2) The method is of value in differential diagnosis.

(3) Non-surgical biliary drainage can be made a valuable aid in treatment.

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PACIFIC COAST ASSOCIATION OF ANESTHETISTS

The Pacific Coast Association of Anesthetists will hold its first Scientific Meeting at Yosemite, Yosemite Park, Monday and Tuesday, May 15-16, 1922, in conjunction with the meeting of the Section on Anesthesiology of the California State Medical Society.

Membership in the Pacific Coast Association of Anesthetists is open to all licensed and qualified members of the medical and dental professions, as well as to research workers holding doctorates of similar standing, who are interested in advancing the specialty of anesthesia.

Send for and fill in the details of a membership application and return it with your check or money order for the annual dues (\$5) so that your Membership Card may be sent you in advance of the meeting. Also be sure and send the names and addresses of as many prospects for membership as you know of.

For further information, address, Eleanor Seymour, M. D., Sec'y-Treas., 1329 South Grand Avenue, Los Angeles, California.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

DR. KELVIN D. LYNCH, Mills Building, El Paso, Texas	Editor in Chief.
DR. PAUL GALLAGHER, Mills Building, El Paso, Texas.....	Associate Editor
DR. J. W. ELDER, Albuquerque, New Mexico.....	Associate Editor
DR. W. WARNER WATKINS, Box 1328, Phoenix, Arizona	Managing Editor

ARIZONA STATE MEDICAL ASSOCIATION MEETING

Prescott and Jerome, June 14th and 15th.

The Thirty First Annual Meeting of the Arizona State Medical Association will be held in Prescott, on June 14th and 15th. Prescott is the county seat of Yavapai County, the other chief city being Jerome. It is in the northern part of the state, and is conveniently reached over the Santa Fe main line from northern Arizona and New Mexico, over the Santa Fe short line from Los Angeles, changing at Wickenburg, or over the Southern Pacific and Arizona Eastern through Phoenix, for southern Arizona and southern California.

Several special features of the meeting have been arranged, notable among which are the following:

Through the courtesy of the Commanding Officer at U. S. Veterans' Hospital No. 50, Whipple Barracks, and his staff, clinics will be held at this hospital on the mornings of June 14 and 15. Opportunity will be given all members of the Association to see the work of this hospital, in x-ray, clinical examinations and treatment, including artificial pneumo-thorax and heliotherapy.

After lunch on June 15th, members of the Association will be taken by auto to Jerome, 30 miles distant, over one of

the finest roads in the state. Through the courtesy of the Chief Surgeon and the management of the United Verde Mine, members will be taken to the 1000-foot level where a contest will be held between First Aid Teams of the United Verde and the United Verde Extension Mining Companies. The details of this contest will be arranged by a committee of the Medical Association who will act as judges and make awards. Several papers will probably be read before the Association in the mine. The remaining sessions of the Association will be held in Jerome that afternoon and evening.

The Yavapai County Medical Society and the Commanding Officer at Whipple Barracks, and his staff are arranging a full program of entertainment for the visiting physicians and their ladies. A dinner-dance will be given at the Yavapai Club, Prescott, on the evening of the 14th, and a dinner-smoker will be held in Jerome on the evening of June 15th. A ladies' committee will look after the comfort and entertainment of visiting ladies during their stay in Prescott and Jerome.

An excursion to the Grand Canyon will be arranged for June 16th, and following days, if a sufficient number signify a desire to take this trip.

MEMBERSHIP IN THE NEW MEXICO MEDICAL SOCIETY

Under the plan of organization which is operating in New Mexico, no doctor in that state can show a legitimate excuse for not being a member of the state organization—if he is a legitimate and ethical practitioner.

In the counties where there are county societies, every doctor should be a member, because such membership means that he has the stamp of approval of his fellow practitioners, that he has their good will, and that he is willink to join with his confreres in upholding the ideals of medical practice and building up the influence of medical men in the social fabric. If a man is not a member of the county organization, it means only one of two things: (1) he is not interested in these vital things and his medical ideals are purely selfish, or (2) he is not professionally eligible to associate with ethical practitioners. There are very few such in New Mexico.

However, New Mexico DOES contain the highest percentage of doctors of any state in the Union who are not members of the State Medical Society, these non-members being almost entirely in counties where no county medical society exists. But it is not necessary, in New Mexico, for a doctor to be a member of a county society in order to hold state membership. If no county society exists in YOUR county, doctor, you can become a member of the State Society and through it, if you desire, of the American Medical Aassociation, by making application direct to the State Secretary, Dr. J. W. Elder, Albuquerque, N. M., remitting the state dues of \$3.00.

Such state membership carries several direct advantages: (1) it entitles you to receive the official publication of the Society—SOUTHWESTERN MEDICINE; (2) it carries with it eligibility to fellowship in the American Medical Association; (3) it establishes your status as a recognized ethical practitioner, for the information of life insurance companies, etc., when

they are seeking representatives; (4) if you expect to remain permanently in New Mexico, it enables you to take your place in the medical councils of the leading practitioners of the state; (5) should you leave the state and locate elsewhere, a transfer card from the State Society will give you standing and recognition anywhere in the United States.

New Mexico is one of the few states which will permit such membership, and no doctor living in isolated communities can afford to overlook the advantages of such State Society affiliation.

THE NEW MEXICO MEDICAL SOCIETY MEETING

The fortieth annual meeting of the New Mexico Medical Society was entertained by the McKinley County Medical Society, at Gallup, on April 28th and 29th. This Society furnished arrangements which might well be the envy of metropolitan meetings. The meeting place was the Congregational Church, which is arranged so that it can be darkened, and is equipped with an excellent moving picture machine and a powerful lantern slide machine. Both were used in the papers, the pastor of the Church acting as machine operator.

The entire City of Gallup joined in making the meeting a success, the court reporter being loaned to the meeting for taking discussions, and the civic organizations joining in social entertainments of the visitors and members.

General Brown, of the state militia, escorted a party of visitors to the Zuni Indian Reservation, his intimate knowledge of Indian legendry making the trip a rare treat for the doctors.

When the visitors overflowed the hotel "El Navajo," they were entertained in the homes of the local members.

More details of the social entertainments are given in the following detailed record of the session:

The fortieth annual meeting of the New Mexico Medical Society was held in Gallup, on April 28th and 29th, and was a successful meeting from every standpoint. The registration at the meeting included the following:

W. B. Cantrell, Gallup.
 C. Russell, Astesia.
 Warner Watkins, Phoenix.
 J. G. Holmes, Alamogordo.
 J. D. Mulder, Reheboth.
 Nelson W. Janney, Los Angeles.
 J. W. Elder, Albuquerque.
 Hugh Mullarky, Tohachi.
 S. D. Swope, Deming.
 J. R. Van Atta, Albuquerque.
 J. H. Boyle, Gallup.
 A. R. Hatcher, Wellington, Kans.
 Robt. Werndorff, Wellington, Kans.
 Polk Richards, Ft. Defiance, Ariz.
 G. S. McLandress, Albuquerque.
 Geo. Piness, Los Angeles.
 Arthur DeLong, Gallup.
 J. W. Stofer, Gallup.
 H. G. Wilson, Gallup.
 T. E. Pressley, Roswell.
 H. A. Miller, Clovis.
 E. C. Prentiss, El Paso.
 G. K. Angle, Albuquerque.
 Crum Epler, Pueblo, Colorado.
 Rex Duncan, Los Angeles.
 J. W. Hannett, Gallup.
 P. G. Cornish, Jr., Albuquerque.
 G. H. Luckett, Santa Fe.
 C. H. Clark, Gallup.
 C. A. Mozley, Breece.
 E. W. Phillips, Phoenix.
 Titian Coffey, Los Angeles.
 E. A. Dodson, Gallup.
 H. T. Watson, McGaffy.

The session opened at 10 a. m., Friday forenoon, in the Congregational Church, the President, Dr. C. Russell, of Artesia, presiding. Rev. Louis A. Stark gave the invocation, and the address of welcome was delivered by the Mayor of Gallup, A. T. Hannett. Dr. J. W. Hannett, the president of the McKinley County Society responded on behalf of the entertaining Society, and Dr. S. D. Swope, of Deming, responded on behalf of the State Society.

Dr. J. W. Stofer, of Gallup, was then requested to escort to the chair and introduce the incoming President, Dr. H. A. Miller, of Clovis. Dr. Miller's presidential address will be found in this issue of SOUTHWESTERN MEDICINE.

A telegram from Dr. McBride, whose paper was next on the program, was read, in which he expressed his regrets at being unable to attend the meeting. The paper of Dr. Rex Duncan, of Los Angeles, on "Recent Developments in Radio-Therapy," was given at this time. This paper gave the latest report on the developments in short wave length or high voltage x-ray therapy in the treatment of cancers. It was discussed by Drs. Watkins, Mulder, Prentiss, Hannett, Epler, and closed by Dr. Duncan.

Following this paper, the Society adjourned to become the guests of the Kiwanis Club of Gallup at luncheon at El Navajo Hotel. This Club served an elegant banquet, supplemented by a Jazz Band and a troupe of jubilee singers from the Chatauqua, which was showing at Gallup, at the time. This with several short speeches made a very welcome diversion for the scientific meeting.

The House of Delegates met at 1:30 and received a report from Dr. Watkins, Managing Editor of SOUTHWESTERN MEDICINE on the new plans and arrangements for publishing the journal and on the support which it was desired that each constituent society should give the journal, which is the official organ of the Society.

The Scientific Session convened at 2 p. m., the first paper of the program being a talk by Dr. W. W. Waite, of El Paso, on "Waste Products and Their Elimination." This was discussed by Drs. Lynch, Hannett, Angle, Swope, Luckett, Prentiss, the discussion being closed by Dr. Waite.

The second paper was by Dr. Nelson W. Janney, of Los Angeles, on "The Dietetic Management of Complications of Diabetes, Including Surgical." This gave a very graphic and well illustrated idea of the present situation with regard to the treatment of diabetes and what can be accomplished by scientific handling of these cases. It was discussed by Drs. Mulder, Waite, Swope and Watkins, the discussion being closed by Dr. Janney.

The next paper was by Dr. G. H. Luckett, State Health Commissioner of New Mexico, on "State Medicine." This aroused considerable discussion, joined by in Drs. Lynch, Waite, Epler, Duncan, Watkins, Hatcher, Angle and Swope, closed by Dr. Luckett.

The scientific session was adjourned at this point until 7:30 p. m.

The first paper at the evening session was by Dr. J. D. Mulder, of Reheboth, on "Trachoma." It was discussed by Drs. Richards, Luckett, Waite, Presley, Angle, and closed by Dr. Mulder.

The second paper of the evening was a special paper, by Dr. A. R. Hatcher, of Wellington, Kans., on "Prostatic Surgery and Some of Its Problems." It was discussed at some length by Dr. Lynch and by Dr. Duncan, Dr. Hatcher closing.

Following the evening session, the Society was entertained at a smoker and boxing exhibition, at the City Club, under the auspices of the American Legion. Most of the boxers were members of the National Guard, two detachments of which were stationed at Gallup.

On Saturday forenoon, the meeting was called to order, at 9:30, by President Miller, the first paper being by Dr. Crum Epler, of Pueblo, Colorado, on "The Operation of Election in Cholecystitis." The argument of the paper was in favor of surgical treatment of gall-bladder disease, by removal of the gall-bladder. It was discussed by Drs. Cornish, Hannett, Lynch, Hatcher, and closed by Dr. Epler.

The second paper of the morning was by Dr. E. C. Prentiss, of El Paso, on "Oxygen and Light in Their Relation to the Incidence and Growth of Cancer." It was discussed by Drs. Watkins and Waite, Dr. Prentiss closing.

The last paper of the morning was by Dr. Geo. Piness of Los Angeles, on "Present Aspects of the Etiology and Treatment of Bronchial Asthma." It was discussed by Dr. E. W. Phillips, of Phoenix, and the discussion was interrupted for luncheon.

The luncheon was served by the Sisters at the Hospital, and was a real banquet, both in abundance and in the spirit of the social diversion.

In the afternoon, convening at 2 o'clock, the discussion of Dr. Piness's paper was resumed, Drs. Hannett, Swope and Watkins participating and Dr. Piness closing.

At this point, the report to the general session, of the House of Delegates was made by Dr. Elder.

The resolutions introduced by Dr. Swope the previous day relative to the support to be given the official journal, were announced as having been accepted by the Council.

The following officers were elected for the coming year:

President—Dr. H. A. Miller, Clovis.

President-Elect—G. S. McLandress, Albuquerque.

Vice-Presidents—J. G. Holmes, Alamogordo; S. L. Wilkinson, Belin; T. E. Pressley, Roswell.

Secretary-Treasurer and Associate Editor—J. W. Elder, Albuquerque.

Delegate to A. M. A.—H. A. Miller, Clovis. Alternates—W. B. Cantrell, Gallup.

Council for One Year—C. S. Losey, East Las Vegas; G. S. Luckett, Santa Fe.

Council for Two Years—H. V. Fall, Roswell; J. B. Westerfield, Clovis.

Council for Three Years—S. D. Swope, Deming; P. G. Cornish, Sr., Albuquerque.

The next annual meeting will be in Albuquerque, the time to be decided by the President, the Secretary and the local society, except that it must be held before the American Medical Association meeting.

The next feature of the program was a moving picture of syphilis, loaned by the Public Health Department, as a part of the Government's campaign against venereal disease. Reel 1 showed the methods of diagnosing the primary and secondary stages, illustrating various lesions, the examination for spirochetes and the Wassermann Test. Reel 2 showed illustrations of tertiary lesions and neurological cases. Reel 3 showed the methods of treatment by arsphenamine and mercury injections and educational methods. The discussion on the films was given by Dr. K. D. Lynch, of El Paso.

Following the films, Dr. Werndorff, of Wellington, Kans., gave an illustrated talk on

"Tuberculosis of the Hip," the lantern slides being very excellent reproductions of anatomical features and pathological conditions in this disease.

The next paper was on "Chronic and Sub-acute Appendix Disease," by Dr. W. Warner Watkins, of Phoenix, Arizona, illustrated by lantern slides of radiographs showing various types of these conditions. It was discussed by Drs. Prentiss, Cornish, Mulder and closed by Dr. Watkins.

The last paper of the scientific program was by Dr. Titian Coffey, of Los Angeles, on "Repair of Cervix Nine Days After Delivery," illustrated by several lantern slides showing conditions at time of operation and several weeks later. The theme of this paper was to delay repair of cervical tears until the cervix had returned to normal, but to make the repair before allowing the patient on her feet; in other words, on the ninth day. The paper was discussed by Dr. Swope, Dr. Coffey closing.

The Resolutions Committee presented their report, to the effect that the cordial thanks of the Society be extended to the McKinley County Society, the Kiwanis Club, the Sisters at the Hospital, the American Legion, the Congregational Church and its Pastor, Rev. Stark for his assistance in loaning and operation of the moving picture machine and lantern slide machine for the illustrated papers.

The meeting closed with a banquet at El Navajo and a reception and dance at the City Club. Dr. S. D. Swope presided at the banquet as Toastmaster and the following responded to toasts: Drs. Willson, Mullarky, Dodson, Elder, Duncan, McLandress, Cornish, General Brown, Mulder and Watkins. Following the banquet adjournment was taken to the City Club for the dance.

EL PASO COUNTY MEDICAL SOCIETY

The El Paso County Medical Society met in regular session on Monday, March 20, 1922, with 67 members and visitors present.

Drs. R. B. Homan and W. R. Smith reported and demonstrated a case, a woman, age 38, who had been sent from post to post on account of asthma. An x-ray examination made here showed a lemon size aneurism of the arch of the aorta. Two years ago before the onset of the asthmatic symptoms a Wassermann was made in another section of the country but the result was not communicated to the patient. Recent advice from that physician indicated that at that time the reaction was positive but no anti-syphilitic treatment had ever been given. The case, in addition to the asthmatic attacks, showed a typical bruit over the aorta, a classical tracheal tug and demonstrable widening of the aortic dullness. Dr. Homan reiterated a statement previously made several times before the society that all

asthmatic patients should be fluoroscoped. He also stated that the results of Wassermann examinations should be given to patients, for in this case the present distressing condition could probably have been avoided.

Dr. H. Crouse reported and demonstrated a case of a woman, age 35, whose chief symptoms were those usually found in postero-lateral sclerosis except the Babinski sign which was negative. The blood and spinal fluid showed negative Wassermann reaction, globulin was negative, mastic test negative and the spinal cell count was three. The general spastic condition was marked, particularly when the thigh was flexed on the abdomen and the leg on the thigh. There was an odd staring of the eyes but the thyroid was negative. The general physical findings outside of the above were negative except that the mouth was in a frightful condition with virulent form of so-called trench disease. Sterilization of the mouth and competent dental care, coupled with Burhan's soluble iodine, had given marked improvement. The case was shown because of its simulating in same ways postero-lateral sclerosis of Charcot and Erb.

Drs. Leigh and W. L. Brown demonstrated a specimen of an intussusception removed from a baby twelve weeks old who had presented an unusual history in that there had been no vomiting or diarrhea and no tumor had ever been demonstrable. When the case was first seen on Friday night, March 17th, there had been no bowel movement for several hours, the abdomen was distended, the temperature was elevated and the patient was in a state of deep shock. Peristaltic waves could be demonstrated and a little bloody material was found in the rectum. Operation was at once undertaken and a Meckel's diverticulum was found which had become inverted into the ileum carrying the bowel with it, about fifteen inches being involved. The patient's condition was grave and all that could be done was a reduction of the intussusception with amputation of the diverticulum. The bowel was in fair condition but there was but little improvement in the condition. The next day the temperature was very high, the bowels had not moved, the distention increased and death resulted. Post-mortem examination showed that the bowel had not recovered.

Dr. K. D. Lynch reported a case of a woman who, for some time past, had been taking "spinal adjustments" from a local chiropractor. The chief complaint was pain over the right kidney radiating to the thigh. Examination disclosed a hydronephrosis with obstruction low in the ureter caused by pressure of a tumor mass the size of a large grape-fruit in the upper part of the pelvis. Dr. Lynch felt certain that the tumor was a retro-peritoneal sarcoma and he seriously doubted the ability of a chiropractor to locate dislocated vertebrae when his tactile sense was not acute enough to feel a tumor the size of a grapefruit.

Dr. Lynch reported another case, one of

cerebro-spinal syphilis, with constant severe headaches. There was partial atrophy of both optic nerves and the blood and spinal fluid showed positive Wassermann reactions. This case had also been under the care of the same chiropractor and had been told by him that the trouble was due to dislocation of the bones at the base of the skull, the headaches being due to pressure on the optic nerves.

Dr. Hugh Crouse gave a resume, in a motion picture sense, covering many different types of neurological cases. Included were illustrations of the different neurological tests covering the deep and superficial reflexes, the various steps of different methods of tapping the spine, and securing the fluids, Landon manometric readings, the method of securing the Swift-Ellis blood, the injection of Byrne's mercurialized serum and the laboratory technique of the Wassermann test, etc. A case of Duchene-Aran-Ledinski progressive muscular atrophy was shown in detail; cases of transverse myelitis, hydromyelia of the cord, exostosis with pressure on the cauda equina were shown as were cases of tumors of the pituitary gland, manifesting themselves as early and late acromegaly. Patients demonstrating the various gaits, spastic, tabetic and hemiplegic, etc., were also shown. A demonstration of an Elsberg laminectomy, the operation being performed on a cadaver, was included in the film.

The talk that followed the pictures covered in a skeleton sense, the insidious and persistent nature of cerebro-spinal syphilis, the eye tests were touched upon, the Caloric and Barany tests were advocated for simicircular manifestations of early syphilis instead of the bone and air conduction tests heretofore used, the latter being subjective and, as such, to be avoided in accurate diagnostic work.

The talk included a report on a series of twelve cases touching upon the economic and soul affections of central nervous system syphilis. The treatment as described covered the 100 c. c. of 15% salt intravenous administrations by Corbus, being the work of Fisher and popularized by Cushing, Null's spinal drainage, Byrne's mercurialized serum, the Swift-Ellis treatment with and without the addition of Ogilvie's 1/50 grain of mercury.

The speaker stated that his observations in the series had been 20 per cent cures, 30 per cent improvements, 10 per cent made worse and 40 per cent no changes. The manifestations of ill results were paralysis of sphincters of rectum and bladder, parasthetic and anaesthetic zones.

Discussed by Drs. G. Werley, H. H. Stark, K. D. Lynch, Bessie Sweet Werley, G. Turner, J. M. Britton, S. A. Schuster, Major Scott and Major Madigan.

Dr. W. W. Waite followed Dr. Crouse's talk with a description of the various laboratory tests done on spinal fluid and laid stress on the taking of spinal pressure and examination of the spinal fluid in all suspicious cases.

(Continued on page 222)



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(Continued from page 220)

The regular bi-monthly meeting of the El Paso County Medical Society held April 24th at the Toltec Club, was in the form of a joint meeting with the El Paso County Dental Society, the meeting being preceded by a banquet of the two organizations honoring Dr. Truman W. Brophy of Chicago, who was the guest of the evening. Present were 55 members of the Medical Society, 25 members of the Dental Society and 12 visitors.

The usual business procedure of the Medical Society was not followed and after preliminary talks by Dr. G. H. Mengel, of the Dental Society; Dr. P. H. Brown, of the same society, and Dr. Hugh Crouse, of the Medical Society, the President of the Medical Society, Dr. R. B. Homan, who also acted as the toastmaster, introduced the guest, Dr. Brophy, who addressed the meeting on the subject of "Hair Lip and Cleft Palate, Illustrated by Slides."

Dr. Brophy's address, which was by way of explanation of the pictures, showed the results and conclusions obtained by him after some forty years of practice during which time he has given the greater part of his attention to the subject in question. He stated that when a hair lip and cleft palate is repaired by giving attention only to the hair lip and anterior part of the cleft palate, the bones of the palate will move toward each other anteriorly and separate posteriorly which is disastrous and results in voice impairment. In neglected cases the tuberosities of the upper jaw tend to spread, causing the teeth to extend posteriorly in a straight line instead of a gentle curve as nature provides in a normal mouth. The doctor thinks that the whole question is, first, one of bone surgery when the bones are involved; then, the lip and, later, the soft palate should be cared for and, finally, if the nose is flattened, a plastic operation to correct this is necessary. If this procedure is followed the best interests of the patient have been secured.

The pictures showed some fifteen forms of

hair lip and cleft palate and clearly showed that the condition is not one of absence of tissue, except in rare instances, but a failure of tissues to unite properly. By cross sections of infant cadaver skulls it was shown that the tongue during gestation is very large and lies partly in the nasal cavity and may therefore be a factor in the production of cleft palate by preventing the bones from coming together. A large number of pictures demonstrating the operative technic of lengthening the soft palate and the later plastic operation for correction of the flattened nose, were also shown. Throughout the demonstration were shown many pictures showing conditions of hair lip and cleft palate, complicated in some instances by protruding pre-maxillary bones, before operative measures were instituted and also pictures of the same cases showing the beautiful results obtained after operation.

Gen. Geo. P. Rains, a physician of Marshall, Texas, briefly addressed the meeting on the formation of the new Texas National Guard, the performance of which duty brought the doctor to El Paso.

Dr. George M. Dunne, of Sierra Blanca, Texas, was accepted as a non-resident member of the Society.

The membership of Dr. Meyer I. Leff was transferred from the Sullivan County (New York) Medical Society to this Society.

Yavapai County Medical Society—The monthly meeting of the Yavapai County Medical Society was held at Whipple Barracks, Quarters No. 6, Tuesday evening, March 6th, in conjunction with the Medical Officers of Whipple.

There were present from the Yavapai County Society, Drs. Looney, Swetman, John T. Taylor, Yount, Southworth, Wilson and Flinn. From the Veterans' Hospital, there were present, Drs. Allee, Loewy, Grieger, Allen, Fales, Rasmussen, Herrick, Brooks, Christian, Carmen, Hamilton, Dupree, Fahy, Bell, Mattice, Gotterdam and Rene.

A NEW MEXICO MEDICAL JOURNAL. Drs. A. E. Gochicoa, C. Canseco, A. Alarcon and A. Cuaron, of Tampico, Mex., have founded the *Revista Medica de Tampico*, a medical publication to be issued monthly, the first number of which has just made its appearance. The aforementioned doctors will be co-editors of the *Revista*.

AN EMERGENCY REMEDY

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GASTRIC POLYPOSIS*

LLOYD BRYAN, M. D., *Instructor in Roentgenology University of California, San Francisco, California.*

The relative frequency of benign mucous membrane tumors of the stomach is difficult to estimate, as no complete statistics are available, but they are not as rare as many clinicians have believed and are common enough to demand earnest consideration of the surgeons who should appreciate their relation to carcinoma of the stomach.

Menetrier designates these tumors as polyadenomata and divides them into a pedunculated type "polyroid polyadenomata" and the fan-shaped flat type "polyadenomes en nappe."

Balfour reports 1 case in 8000 abdominal sections for gastric lesions, Ebstein 14 cases in 600 necropsies, and Doering has collected 50 cases of the gastrointestinal tract. Of these, 33 occurred between the ages of 10 and 40 years. Verse gives similar figures for 45 cases. Men are more often affected than women, the rates being about 3:2.

Hauser and others believe that these growths develop on the basis of chronic inflammation. Kontetzny has conclusively demonstrated the gradual transition from gastritis through adenoma to carcinoma. Otto reports a case in which a thick piece of wood was swallowed causing marked gastric symptoms for a year and finally resulting in death. Necropsy showed

the wood in the center of a large adenoma. Zabel found large numbers of megastoma intestinale in the tufts of a large gastric papilloma with malignant degeneration.

As far as can be ascertained from available statistics, carcinomatous degeneration of these tumors occur in 60% of the cases which makes them important as precancerous growths. Many authorities believe that most gastric cancers arise either from actual adenomata or from their earliest stages. The importance of the diagnosis of these lesions is hence apparent and it is only by means of a careful roentgen examination that a positive diagnosis can be made, except in those rare cases where a piece of the tumor has been vomited or obtained during a gastric lavage. The pathological report of the case here reported is typical of the pathology of these tumors. The symptoms in these cases are typical of malignancy, i. e., nausea, vomiting, achylia, occult blood in the stools, with secondary anemia. However, there is not the marked loss of weight or anorexia as in malignancy and there is at times a large quantity of an egg white like mucus in the vomitus.

The x-ray picture is fairly typical (Fig. 1), and while it may be confused with malignancy, a careful ex-

*Read at the joint meeting of The Medical and Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society, at Phoenix, Dec. 1 to 3, 1921.



Fig. 1.—Gastric Polyposis. Showing sharply limited defect in greater curvature shadow, with outer line of stomach wall preserved.

amination will differentiate between the two conditions. In malignancy, there is a definite irregular non-lobulated mass projecting into the lumen of the stomach and the wall of the stomach (to which it is attached) is entirely obliterated. In the polypoid growths the mass is lobulated and mottled in appearance and the curvature to which the tumor is attached is seen to be intact. While this may seem to be broken in places, one can still trace out the fine lines showing the remains of the curvature. Also, under the fluoroscope, one can see the opaque meal run over and around the lobulated masses much as water runs around the boulders in a stream.

The following case report is of interest as the patient was operated on 10 months previous for an ulcer of the pylorus. The pathological report at that time showed no evidence of a polypoid or adenomatous growth.

V. T.—Age 62, male, Swedish laborer. Complaint: swelling of legs, continual burning in the perineal region; frontal headache.

F. H.—Father dead, 72, accident. Mother dead, 68, old age. One brother dead, about 40, typhoid. One sister dead, age 5, cause unknown. One sister dead, 20, heat stroke. One sister dead, 25, pneumonia. One sister dead, 60, cause unknown. No relative has ever had

cancer, tuberculosis or insanity. No history of kidney or heart disease.

P. H.—Lived up to age of 14 in Sweden; 14 to 23 in Kansas (farm laborer); 23 to 62 in California (farm laborer). Measles about 10; typhoid about 25, in bed three weeks; gonorrhea about 25; lues about 35 (chancere).

Uses notobacco, alcohol or drugs; coffee three times a day. Has had no accidents. Had prostatectomy in 1916. Operated for ulcer of stomach at University of California Hospital, in January, 1921. Best weight was 190 pounds at 30 years; average weight 175 pounds; present weight 158 pounds.

P. I.—Swelling of the lower extremities. This began five years ago, nine months after prostatectomy. First noticed swelling in both ankles. This would go down during night and reappear the next morning, but there have been periods of months when there would be no swelling at all. During the past six months, swelling has been more persistent and more extensive. During past month swelling has been persistent both by day and at night. Skin over swollen areas feels hot and itches. No pain present. Eyelids have been more or less swollen during past two months. Hands have been swollen during the past week.

Burning pain in perineal region. Pain came on gradually, following the prostatectomy and has been persistent to date. It has progressively increased in severity. Pain relieved by urethral irrigations and cautery treatment at Stanford clinic.

Headaches. Generally come on after eating. Frontal in type. Began four months ago. Getting progressively more severe. Duration variable.

Systems: Circulatory. Short of breath, palpitation of heart after eating and exercise; precordial pain at times, slight while lying down. Respiratory; no cough, catches cold easily; no hemoptysis. C. S. S.: Appetite good; nauseated at times after meals; no vomiting; no abdominal pain; no diarrhea; no tar colored stools; no blood passed; somewhat constipated. G. U. S.: Nocturia, V; burning on urination; no blood passed; no sexual desire; some hesitancy; dribbling after urination; no discharge. C. N. S.: No blindness in any of the fields; no periods of blurred vision; no scotomata.

P. E.—Appears to be about stated age; patient is anemic with suggestion of nephritic facies. Skin: Nothing of note. Head: No abnormality of development; hair scanty. Face: Slight edema of upper lid; pupils equal and regular, react to C. and D.; extrinsic muscles O. K. Nose: Negative. Mouth: Teeth fair condition; gums negative; mucous membrane not inflamed; tongue protrudes in midline with tremor. Throat: Tonsils not inflamed or enlarged; mucous membrane not inflamed. Ears: Negative externally. Neck:



Fig. 2.—Case reported, before second operation. Shows pylorus resected, and tumor mass projecting into greater curvature shadow.

few palpable glands; thyroid not palpable. Chest: Fairly well clothed, bulging over precordial region; left chest has slightly greater excursion; right chest has slight amount of lateral bulging. Heart: Not enlarged to right or left; no displacement downward; rate 70, rhythm regular; no murmurs; A2 greater than P2; sounds of poor quality. B. P., 120/70.



Fig. 3.—Case reported, before first operation. Gives the roentgen appearance of carcinoma of pylorus. Resected pylorus showed healed ulcer.

Lungs: No rales; no impaired resonance; no dullness; breath sounds clear. Abdomen: Appears somewhat distended; no visible peristalsis or alterations of contour; somewhat tympanitic; no flatness in flanks; kidneys, liver and spleen not palpable; no tenderness or pain on deep or superficial palpation (supraumbilicus midline scar present). Back: Negative. Extremities: Edema of feet and ankles and extending up leg to region of knees. Reflexes: All present and normal; no abnormal reflexes elicited. Genitalia: Negative.

Laboratory Report: RBC, 4,160,000; WBC, 6,400; Hbg, 75% on Oct. 4th, 1921; 55% on Oct. 11th, 1921; Polys, 74%; S. L., 24%; L. L., 2%. Wassermann, negative. Urine, negative. Stool, positive for blood on Oct. 7th and Oct. 16th; patient on meat and fish free



Fig. 4.—Hypertrophic Gastritis. Believed to be the first stage of gastric adenoma and carcinoma.

diet. Ewald Ttest Meal: No free HCl; total acid as follows: First 15 minutes, 16; second 15 minutes, 30; third 15 minutes, 45; fourth 15 minutes, 20; fifth 15 minutes, 20; sixth 15 minutes, 42; seventh 15 minutes, 65; eighth 15 minutes, 40.

Resume of Patient's Illness at University of California Hospital in January, 1921: Complaint: General weakness, shortness of breath and nausea shortly after meals. Past history same as above. Present illness, typical history of peptic lesion. Diagnosis: Early carcinoma of the antrum with metastasis to the pancreas.

Operative Findings: Pyloric ulcer, glands along lesser curvature. Pylorotomy: Mayo polya operation done.

Pathological Report: Specimen consists of a piece of tissue labeled "stomach," more or

less about 5x4 c.m. One surface is covered by peritoneum with some large vessels which have been tied off. The other surface is covered by mucous membrane. The pylorus cannot be identified. There is a considerable thickening of the muscle at one point and if this is the pylorus, there is, about 2 c.m. above the pyloric opening, a definite depression about 4 m.m. across and 2 m.m. deep. In cutting through this, there is demonstrated a depression which is apparently due to a thinning of the mucous and sub-mucous layers. There is no evidence of a complete destruction of the mucosa as in the full-fledged ulcer. The color of this area seems to be about the color of the rest of the mucosa.

Section shows at the area of depression a thinning of the mucosal and sub-mucosal layers resulting in a considerable shortening of the gland downgrowths and a considerable decrease in the number of these structures. There is, at this point, a mild infiltration with round cells but otherwise no evidence of inflammation. The sections do not show any break in the epithelial covering. The muscle at this point is somewhat puckered and the layer adjacent to the mucosa is somewhat pitted. This picture suggests very strongly an old healed small ulcer which has resulted in some constriction of the muscle and marked thinning of the mucosa. The thinness of the mucosa and the fact that it is still intact as far as can be detected would indicate that there is a regeneration of this tissue rather than a degeneration. There is no evidence of malignant change.

Diagnosis: Stomach ulcer.

ROENTGEN EXAMINATIONS (October 10, 1921.) No evidence of pathology in the chest. No delay in the esophagus. No cardiospasm. The stomach is small and high and the antrum has been resected and united directly to the duodenum (Fig. 2.) Through this opening, the stomach is emptying rapidly. No peristaltic waves are visible. Arising from the middle third of the greater curvature is a lobulated irregular mass. At the site of the attachment, the greater curvature is broken up into small thin lines but is not totally absent as in a case of malignancy.

CONCLUSION: Benign polypoid growth.

OPERATION: (October 22, 1921, by Dr. Harold Brunn.) Operation disclosed a large soft mass within the lumen of the stomach and attached to the greater curvature by a wide base. There was no infiltration of the gastric wall and the surgeon's impression was that this was a non-malignant condition. On account of previous resection of the antrum, it was impossible to resect the base of the tumor, but it was removed by a cautery. A small mesenteric gland was also removed for examination.

The pathological report was as follows:

Gross: A large irregular mass $5\frac{1}{2} \times 5\frac{1}{2} \times 4$ c.m. and half dozen smaller masses; the large mass is deeply fissured, the surface in apt finely nodular; projecting from the greater part of the surface are numerous fine delicate finger-like processes, so that the mass as a whole resembles coral; on section the tissue is of spongy consistency, rather soft and friable, without any apparent marked vascularity, made up of small pale brown opaque irregular areas. Included with the specimen is a small firm flattened node $1 \times 1 \times \frac{1}{2}$ c.m. which on section shows no gross tumor involvement.

MICROSCOPIC: Sections taken from the large nodule and from several of the smaller nodules show a rich papillomatous growth of which the papillae are sometimes long and thin, at other times shorter and thicker. These are covered for the most part by a single layer of columnar epithelial cells with protoplasm taking a medium deep stain and nuclei that tend to be elongated. Some of the epithelial cells contain a single large clear vacuole in the superficial portion of the protoplasm thus resembling goblet cells. In other places the epithelium shows a tendency to pile up into several irregular layers. Mitotic figures are everywhere numerous. In the central portions of the sections are found spaces, usually small, lined by epithelial cells similar to those covering the papillae, the spaces frequently containing degenerating leucocytes, most of them polymorphonuclears. These may represent glandular structures though some may be cross sections of the deeper portions of crypts. The stroma of the papillae is composed of connective tissue frequently areolar and edematous in appearance particularly that in the distal portions of the papillae. Everywhere the stroma is filled with large numbers of leucocytes including plasma cells, lymphocytes and polymorphonuclear leucocytes. The stroma of the central and more solid parts of the growth contains in addition some small bundles of smooth muscle fibres. In the spaces between some of the papillae there are leucocytes and cellular debris and also occasionally a small amount of some faintly staining material resembling mucus. Small quantities of similar material are found in the tumor stroma, particularly in the central portions. Considerable areas of necrosis are present involving chiefly the superficial surface of the growth and associated with marked fibrin formation and polymorphonuclear leucocytic infiltration, that exudate frequently extending deeply inward between the papillae. Section through the lymph node included with the specimen shows the sinuses filled with leucocytes including numerous lymphocytes, neutrophils, and eosinophils. There is also a slight diffuse increase in connective tissue, but nowhere is there apparent any tumor involvement.

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PERTHE'S DISEASE*—CLINICAL ASPECTS:—REPORT AND STUDY OF A CASE.

DR. R. J. STROUD, Tempe, Arizona.

Some three years ago your attention was drawn to this condition, especially with reference to the roentgenological aspects of the disease,¹ and as the case that is presented tonight has recently come under observation, this presentation will be from the clinical side.

Living as we do in the Southwest, where a great many tuberculous patients are being referred each year, it behooves us not to consider all cases of limp with afternoon temperature as Pott's disease. More and more the advantages of Arizona and New Mexico as health centers are becoming known, and frequently cases are referred as tuberculous which prove otherwise. Such was the case with Dr. Watkins' patient of three years ago. The importance of a diagnosis when a patient presents himself with a limp, pain over the hip joint and referred pain to the

knee, is paramount. No case is complete without a radiograph and a Von Pirquet or complement fixation test for tuberculosis. In fact, the diagnosis between Perthe's Disease and tuberculous hip depends, in the early stages, on the roentgenologist. The prognosis being more favorable in this condition than in either tuberculosis of the hip joint or arthritis deformans, we can do much to relieve the anxiety both of patient and parents as to the final outcome of the case. The most that apparently can happen is a slight limp with slight lengthening or shortening.

NOMENCLATURE: In going over the literature of the subject it seems best to call this condition "Perthe's Disease." When a new name appears before us it is sometimes mystifying that it should bear the name of the scientist who first described the condition,

*Read before the Maricopa County Medical Society, Phoenix, Ariz., in March, 1922.

and this apparently obscures the pathology, but we speak fluently of Addison's disease, the Murphy button, and Poupart's ligament, with the knowledge that we are understood; and now, to my mind, the term Perthe's disease describes the entity of the case here presented. The various names given to the condition are more or less confus-



Fig. 1.—Both hips, showing softening and flattening of the head of right femur, with increased density.

ing. Perthe² called the condition "Osteochondritis Deformans Juvenilis." This is as close as any of the other names given, as it tried to describe accurately the pathological condition. This case would certainly come under this head. Legg³ disputes that the condition is an inflammation and attacks this terminology accordingly; he thinks trauma is the cause, a statement that he goes far to substantiate. He would therefore term the condition "Osteochondral Trophopathy of the Hip-joint." More recently it has been termed by Calve⁴, Coxa Plana as differentiated from Coxa Vara and Coxa Valga. This certainly describes the end result. Zaaier⁵ calls the condition Parosteogenetic Juvenile Osteochondropathy. He considers the condition one of defective ossification, and Calve now agrees in this.

ETIOLOGY: So far, three theories

have been advanced as to the causative factor. This patient tonight points to one of the three distinctly, namely that of an infection of a low grade. Legg, as stated above, holds to the theory of trauma and cites cases; others he describes as of unknown origin. In this connection I wish to call attention to a parallel case of Legg's which presented the same condition as this one tonight. In his "negative traumatic" cases he scribes one G. D. T-30 as having an abscess in the groin nine months previous, which he thinks (as stated in a footnote), had nothing to do with the condition. The limp appeared in three months and lasted six months previous



Fig. 2.—Showing more detail of the softened, flattened and dense head of femur.

to treatment. This abscess healed without treatment. In our case an infection of the groin is described as being present five months before, with slight limp at the time, which cleared up without treatment. There was redness and tenderness and the limp was ascribed to the infection. Blanchard⁶ thinks the disease one of a general nutritional disturbance. He considers that not only the head of the bone, but the



Fig. 3.—Case of Perthe's Disease, reported by Dr. Watkins in 1919, shown for comparison.

whole joint is involved. Frieberg⁷ who first described the infectious origin, looks to the tonsils as the chief offender. This case which we present shows enlarged subtonsillar glands, and while, at the first examination, the tonsils appeared normal, on subsequent occasions definite external foci have been noted. Roberts⁸ describes the condition as that of congenital syphilis, in spite of negative Wassermann reaction. This case has a negative Wassermann, and also shows none of the stigmata that are associated with obscure syphilis in the presence of negative Wassermann reactions. It is certain that osteochondritis may be a manifestation of syphilis but not necessarily all osteochondritis. Kruter⁹ considers the disease a type of arthritis deformans. Pfemister has recently grown organisms from bone taken at operation—not always the same organisms.

PATHOLOGY: The head of the bone is flattened, the neck becomes thickened and shorter, and the ossification

centers disappear. The process is sharply defined except that there are some islands of greater density, so characteristic on the radiograph. The whole process is that of an absorption of paramount importance, especially when considered in the light of considers the disposition of the circulation with no hypertrophic change. Legg trauma, where the circulation is cut off and there is a necrosis following the absorption, accounting for the fever. The dense portions as seen in the roentgen plates, which we have here tonight are not strictly osteophytes in the true sense of the word. All of the authors agree now as to this. These areas are probably being absorbed at a slower rate and are due to pressure; i. e., compressed bone. These thickenings all occur at the margins of the bone. The head is mushroomed, and great destruction takes place, which is restored more or less later, when regeneration occurs.

DIAGNOSIS: In spite of Legg's "seventeen points" the diagnosis depends on the roentgenogram. Here the typical mushrooming has taken place something like a glans penis, with bone thickening as an island near the margin, and short, thickened neck. The whole is well defined and has no true mixed density as in tuberculosis. Legg's seventeen points are described as follows, with comparisons of the present case for study:

- 1 Age—2½ to 12 years. This patient is 5 years and 10 months.
- 2 Appearance of limp. Without history of trauma in this case.
- 3 Prominence of great trochanter on affected side. This can be seen and felt in this case.
- 4 Limitation of motion, most marked in abduction. Here found as described and with some limitation of internal rotation. Flexion is not disturbed.
- 5 No crepitation, capsular thickening. Thickening felt in this case.
- 6 Muscular atrophy of glutei and thigh muscles. In this case right thigh is 12½ in.; left, 13 in.; right calf, 8½ in.; left, 8½ in.
- 7 Little or no pain except at onset.

PERTHE'S DISEASE		HIP JOINT DISEASE		ARTHRITIS DEFORMANS	
1	Pain referred to knee.	1	Pain referred to knee.	1	Pain at joint affected.
2	Impediment of motion.	2	Impediment of motion.	2	Limitation of motion marked.
3	Fever mild.	3	Fever mild.	3	Fever generally high at first.
4	Change in position of leg.	4	Change in position of leg.	4	No clear change unless localized in one joint.
5	2½ to 12 years.	5	3 to 12 years.	5	3 to 14 years.
6	Changes in joint structure (one).	6	Changes in joint structure (one).	6	Changes in joint structure (many joints).
7	Clears up quickly under rest, without brace.	7	Does not clear up after rest.	7	Does not clear up quickly with rest.
8	Child loses no weight.	8	Weight lost gradually.	8	Loss of weight rapid.
9	Looks healthy and of normal color.	9	Looks anemic and phthisic.	9	Patient anemic but not phthisic.
10	Night cries absent.	10	Night cries rarely absent and diagnostic.	10	No night cries.
11	Pain greater at first and gradually lessened with rest.	11	Pain greater at first and gradually increases.	11	Pain very intense at first and does not necessarily clear up with rest.
12	generally one side affected.	12	One side affected.	12	Both sides affected many other joints.
13	Males chiefly affected.	13	Evenly divided.	13	Evenly divided.
14	Glands not enlarged.	14	Glands enlarged only if tbc. of glands.	14	Glands enlarged * *.
15	Spleen negative.	15	Spleen negative.	15	Spleen enlarged.
16	Roentgenogram shows head of bone flattened and dense bone islands with no atrophic change or thinning of bone.	16—	Roentgenogram shows no bone islands but acetabular involvement, atrophic change with thinning of bone.	16	Roentgenogram shows true osteophytes or excrescences of bone not to be confounded with bone islands. Some differences in density of bone.

- Pain was great in this case until rest was given. None since.
8. Little or no spasm. Slight spasm noted here.
 - 9 Trochanter above Nelaton's line. Here $\frac{3}{4}$ in. above.
 - 10 Trendelenburg present. Patient waddles somewhat.
 - 11 Legs equal length. Borne out in this case.
 - 12 Von Pirquet negative usually. Complement fixation for tuberculosis negative.
 - 13 Wassermann and family history negative. Same in this case.
 - 14 No evidence of old rickets.
 - 15 Patient's history negative. Here we have an exception in the condition of the tonsils and subtonsillar tissue, also an infected groin on the same side paralleling a case of Legg's.
 - 16 Duration 6 months to a year.
 - 17 Typical roentgen appearance. Plates of this case are very typical.

I would add to this the preponderance in males, except in those cases of operative trauma associated with reduction of congenital dislocation of the hip, which occur almost entirely in females.

The patient is active, healthy, and has not the anemic appearance of either a rachitic or tuberculous child. Legg states that it occurs in very active children, which is well borne out here. The father describes this boy as exceptionally active.

TREATMENT: Frieberg considers removal of the tonsils as a preventive measure and also to allay the process after it has started. Roberfits reports good success with mixed treatment in spite of a negative Wasserman. Exercise, good food, and fresh air are indicated. While waiting for a brace we have merely put this patient to bed, in order to keep the weight from the head of the bone. Some sort of fixation of the hip is required. It is still in question whether it is necessary for a complete fixation as in tuberculosis. Some authors claim that the disease being self-limited, a minimum of fixation is required. A fixation itself is not pro-

ductive of ankylosis, for many cases mistaken for tuberculosis have been fixed for ankylosis, and afterwards the movements returned, in which case the self-congratulation of the surgeon was in order. All forms of fixation splints have been used, plaster, Thomas splints, side splints, etc., and all seem to be equally efficacious. From my experience in this case it would be impossible to treat without some form of splint, and still keep the weight off the hip. For these patients are lively and healthy ones who will only stay in bed so long. It would seem also that splinting for a bed case is too severe, and that some light appliance with hip fixation, and some lateral traction would be in order, the patient going about on crutches with an elevated shoe on the opposite foot. The length of time necessary for treatment would be about one year, although this should be governed by the roentgenogram and the presence of pus. In this case a side splint is contemplated, and has been ordered.

RESULT OF TREATMENT: In 14 out of 38 cases Legg reports perfect results. In these cases there was no shortening, no limp, and no limitation of motion. Most of the others showed only slight limp and limitation of movement. A few cases showed shortening or lengthening. In all cases recovery is complete, although a warning has been issued by some authors that end results should not be tabulated for some years afterwards. Up to the present time no report can be found of end results for so long a time.

Case W. R. P. Male. Age 5 years 10 months. Mother and father living and well, no tuberculosis or syphilitic manifestations. Two sisters living and well, both younger than the patient.

Past History: Measles at two, chickenpox at three, no whooping cough, no debilitating illness. Always a reckless, active boy.

Present History: Had boils on both knees in September, 1921. Inguinal adenitis late October, 1921, of three weeks duration, with tenderness and slight limp. The limp at the time was attributed to the glandular infection. Tenderness and limp gradually disappeared.

Seven weeks ago he again started limping, this gradually growing worse, and he then complained of pain in right knee.

Patient first seen on January 13th by an osteopath because of pain in knee. He ma-

nipulated hip joint and could find no tender spots. He gave an opinion that hip joint disease was the most probable diagnosis. Patient came to our office on the 11th, and was seen by Dr. Alexander. At this time the temperature was 101. There was some pain in the right knee and tenderness on manipulation of the right hip. A tentative diagnosis of tuberculous hip was made, the patient put to bed and sent next day to the laboratory. The laboratory report showed a negative Wassermann, negative tuberculous complement fixation, and the pictures taken which you see tonight. Dr. Watkins diagnosed Perthe's Disease from the roentgenograms. One picture (Fig. 1), shows the pelvis as a whole with the right sided deformity, and the other (Fig. 2), shows in detail the characteristic shortening and thickening of the neck of the femur, a flattened mushroom head, with broad, flat articular surface. The margins of the non-are well defined, and the characteristic bone island is seen on the upper margin. The articular space is larger and broader, and there seems to be no thinning out, as in tuberculosis, of the acetabular socket. This plate does not show any other involvement than that of the femoral head and neck.

Patient seen again January 21st, after rest in bed. He is brighter and more active, and shows general improvement. Temperature, 99.4; pulse, 92; height, 3 ft. 8 in.; weight 45¼ lbs. Tonsils are slightly enlarged. He is not a mouth breather. He eats and sleeps well. A later examination showed the tonsils slightly inflamed with some small ulcerative areas. This followed a period of slightly higher rise in temperature. The temperature curve has varied from normal in the morning to 99.3 at 4 p. m. With but few exceptions there has been always an afternoon rise as high as 99, and when his tonsils became slightly inflamed the temperature was 100 for two nights. The patient has been at rest in bed from January 21st, is restless, and full of life and good spirits. A Phelps lateral traction fixation hip splint has been ordered and the patient will be allowed to go about on crutches when this is applied. Taking Roberts' suggestion the patient has been put on potassium iodid, and a styptic iron swab has been used since the throat has been affected. The patient, as seen tonight, shows a much different picture than when he first presented himself for treatment. The limp was enormous and the disability great. He acted lame and sick. Now the limp has almost disappeared and most of the signs of the spasm and limitation of motion have gone. Just rest in bed has accomplished this. This one fact, without roentgen ray findings, would be sufficient to distinguish the condition from either tuberculosis or arthritis deformans. In comparing the roentgenographs of this boy's hip with that of a tuberculous hip seen today, the disability of this patient should be many times that of the tuberculous one, and yet this boy is agile, shows little limp, while the tuberculous patient is helpless and has to be car-

ried, in spite of being 8½ years old against 5¼ for this boy, and the tuberculous patient has been kept off his hip for two months.

CONCLUSIONS

1. The name Perthe's Disease conveys to me a definite clinical entity, and usage will certainly establish this as the name by which it will be known. To add Calve, Legg and other subsequent investigators' names makes for confusion, and to use names attempting to describe the pathology and etiology will help the confusion. A plea is made to standardize the name.

2. The etiology is still unknown. It seems as if it should soon be cleared up whether it is an infection or not. With the work now being carried on at the Mayo Clinic as to the specificity of bacteria, and their relative localization in various tissues, a culture from either the tonsil or from the head of a femur so affected which should happen to come to open operation, should quiet title as to definite etiology. This case seems to have a bacterial history.

3. All cases of limp, and all cases of referred knee pain should be roentgenographed.

4. The outlook is hopeful, and treatment consists in fixation with traction sufficient to keep weight bearing from the head of the femur.

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RUPTURED TUBAL PREGNANCY—REPORT OF FOUR CASES*

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It is not the purpose of this paper to present anything new on ruptured tubal pregnancy, but rather to rehearse with you its often obscure and indefinite symptomatology, in the hope that more cases may be correctly diagnosed and timely treatment accorded the unfortunate women.

We have reviewed much of the literature published since 1916 and have been invariably struck by the great disproportion existing between the preoperative diagnosis and the operative diagnosis. The four cases which we append serve to emphasize this point. In spite of the fact that medical literature abounds in citations of every conceivable type and complication and in many exhaustive classic studies of these conditions, our diagnostic acumen does not seem to have been materially improved. When we say "our diagnostic acumen" we use the pronoun in its broadest sense, for it includes our biggest and broadest men.

When we consider that only 50 per cent of ectopic pregnancies are correctly diagnosed after rupture (no one has ventured an estimation of the percentage before rupture), we are led to assign two reasons for the errors: first, as a recent writer has stated, "Many of our conceptions in this regard are centuries old and it cannot be considered strange that the ideas of the profession on a subject, the earliest records of which date to an era so far removed as the tenth century, should be pretty well fixed and that the recent advances should be few;" second, because in making a correct diagnosis, the whole gamut of the differential diagnosis of the female abdomen must be rapidly run, frequently in the face of limited opportunity and wholly inadequate surroundings.

FREQUENCY: While no two writers agree as to the frequency of extrauterine pregnancy it is very evident that, whereas it was formerly considered a pathological curiosity, it has become

a condition of every day occurrence, the tubal type making up 86.7 per cent of the total number.

ETIOLOGY: Very little advance has been made in determining the etiology of these conditions, but we venture the prediction that the laboratory, working with the surgeon, will come to our aid in helping to classify the causes. At the present time, it is agreed that the condition is due to some pathology which impedes and finally obstructs the progress of the impregnated ovum to its normal resting place. Theoretically, this may be due to conditions producing changes in the lumen of the tubes or their epithelium such as the result of inflammatory conditions, neoplastic growth and infantile tubes, or to the changes in the ovum itself, its volume being so increased as to render its passage through the oviduct impossible. This latter view is championed by LaTorre who states that syphilis, tuberculosis and gonorrhoea are responsible for these changes, by altering the structure of the ovum, creating a veritable ovarian hydropsy. That ectopic gestation is the result of modern civilization, as this author contends, is to be doubted, since, for example, one of the cases we report was in a full blooded Pima Indian, removed from primitive life by her own generation only, and from the further fact that ectopic gestation is said to be not uncommon in the lower animals as the ape, cow, sheep, bitch and hare.

SYMPTOMS: Practically all observers place pain as the most constant symptom. (In Graham's series of 100 cases, only one stated there was no pain.) The pain is variously described as "bearing down, grinding, tearing, sickening and sore pain." The pain is usually complained of in the pelvis to the right or left as the case may be, but has been located as high as the epigastrium and as low as the rectum. We interpret Mussies' observation on pain in the rectum in these cases to mean that when

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the symptom complex points to ectopic pregnancy, the symptom of pain in the rectum, or painful defecation, if not due to rectal disease, seems pathognomonic.

Before leaving the subject of pain, we desire to call your attention to the observations of H. F. Lewis, based on his study of 168 cases. He found sudden abdominal pain in less than 50 per cent, colicky pain in the lower abdomen in a little more than one-third of the cases, but abdominal tenderness in 80 per cent, adding that the more severe the symptoms the more accurate the diagnosis. Graham's idea is that when a patient describes the pain that is present in ectopic gestation, we must have in mind many morbid pelvic conditions, i. e., appendicitis, perforation of the intestines, lesions of the stomach and gall bladder, but if, in addition to pain, she speaks of delayed menstruation followed by irregular flow, the first thought that comes to mind should be ectopic gestation. Heaney says, "that to emphasize the severity of the pain as the significant feature is like dwelling upon the emaciation in cancer of the uterus. To await it, in otherwise clear cases, is to court disaster. The condition of any woman of obstetrical age who is seized by abdominal pain of severity, followed by shock and syncope, even if transient, must be regarded as possibly due to ectopic pregnancy, until proven otherwise."

The second most constant symptom occurring in over 90 per cent of cases, according to Heineberg, is hemorrhage from the uterus. This symptom, together with other menstrual disturbance, is considered more distinctive than pain, although less constant. We find it impossible to reconcile the observations of various writers concerning the character of the flow. It is, however, easier to reconcile the statements as to amount, since the majority find it scant rather than abundant and intermittently prolonged. We are impressed with Heaney's thought that "every patient presenting herself with the suspicious symptoms of a threatened, imminent or incomplete abortion,

should be examined with the possibility in mind that the condition may be ectopic pregnancy, more especially if the cramps are located in the side of the pelvis instead of over the uterus."

In considering the symptoms of ruptured tubal pregnancy we quote freely from Heineberg who classifies ruptures into *tragic* and *non-tragic* types. Under *tragic* terminations of rupture the classic symptoms are sudden, severe, cutting pains, usually in the iliac region on the side of the pregnancy. Frequently fainting, followed by symptoms of concealed hemorrhage, such as pallor, restlessness, thirst, air hunger, increasing weakness, faintness, dark spots before the eyes, increasing pulse rate and decreasing arterial tension. Pulse rate may not increase for two or three hours after rupture. Abdominal tenderness and rigidity soon appear and may extend further than the lower part of the abdomen.

In the *non-tragic* type the above symptoms are modified as to severity. The cases are more insidious in onset with slow bleeding. Here the most significant symptom is the hemorrhage which is continuous from the onset. The blood is not profuse as a rule and is darker than menstrual, slimy, and frequently contains shreds of decidual membrane. Pain is of varied character but constant as to location and tendency to recurrence. It is always more severe during defecation and urination.

PHYSICAL SIGNS: Uterine enlargement is found in one-third of the cases. There is a palpable mass usually in one of the fornices in two-thirds of the cases; the vaginal mucous membrane shows turgescence, the cervix is soft, the os patulous, while the uterus usually shows some enlargement. Heaney notes that it may show no appreciable increase in size, and may be smaller than normal. There is usually found a mass, often extending from side to side, sometimes filling the cul-de-sac of Douglas, sometimes attached to the uterus, while in others the uterus moves independent of the mass; all these are difficult to determine, and often impossible on account of tenderness. Tenderness is a very valuable

sign, even though it may mask other physical signs, as Proust states, "after rupture of a pregnant tube it may be impossible to palpate any accumulation of blood in the pouch of Douglas, but deep palpation will often elicit sharp, sudden pain, so severe that when the patient is half swooning, the pain makes her cry out."

DIAGNOSIS: A careful history of the case, studied in perspective, together with a careful bimanual examination, under an anesthetic, if necessary, should materially reduce the number of mistaken diagnoses. Even the cases of incomplete abortion, with all the evidence at hand of a correct diagnosis, should be examined bimanually for it is quite possible to have a co-existing extra-uterine pregnancy, but more particularly should this examination be made when only decidua is found for decidua may be only a camouflage of a tubal pregnancy.

TREATMENT: The safe and sane procedure is to operate as soon as a diagnosis is made. This applies to the tragic type as well as to the non-tragic. In the tragic type stimulation is contra-indicated, but anodynes, salt solution, and possibly a resort to autogenous transfusion, i. e., using the blood found in the patient's abdomen, as reported by Licktenstein, are indicated.

Case 1—Mrs. R. K. A., white; age 32; nullipara. Had measles, whooping cough and mumps as a child. Later, had fainting attacks, would always be very sick afterward with bilious attacks.

Began to menstruate at age of 14. Twenty-eight day type and painful. History of backache, but no leukorrhea. In 1912 was in a tuberculosis sanatorium for incipient tuberculosis.

Patient had no previous pregnancies and had missed no previous periods. Missed her December period; about January 11, 1920, began to flow. A few days before this, however, she had some severe obstruction for which physician was consulted. She had severe griping pains, very little gas distention, and no fever. Bowels moved with elaterium and colonic flushings. Patient felt better after bowels moved. Next day she had severe pains in lower abdomen and she began to flow. Pain was "bearing down" in character. Her physician called, found a foul mucopurulent bloody vaginal discharge; temperature 102½. Examination revealed a mass just above cervix. Cervix slightly dilated. Diagnosis "incomplete abortion." Curretted Janu-

ary 16, 1920, and got about a "handful of degenerated decidua." Improved after curettage, and temperature came down to normal. The night following the fourth day after curettment (January 21), she developed a sudden severe pain in the right side and collapsed, cold, clammy sweat, and very feeble pulse, too rapid to count. Vaginal examination by her physician revealed uterus low down and fixed on right side. Diagnosis—"ruptured pyosalpinx." Brought by automobile sixty miles over mountain to hospital at Prescott, arriving about 10:20 p. m., January 24, 1920. Patient vomited dark green fluid nine times during the first four hours at hospital. Appearance was that of patient in advanced peritonitis with intestinal obstruction. Three days were spent in getting patient in condition for operation, and much to our surprise, she stood the ordeal well. Operative findings 'ruptured tubal pregnancy, right side; left pyosalpinx, acutely inflamed appendix and plastic peritonitis with agglutination of two knuckles of small intestines, giving partial intestinal obstruction."

Patient made a slow recovery, but has enjoyed good health since. It is to be regretted that the blood findings were not made in this case, as the hemoglobin and cell count would certainly have borne out the clinical appearance of an extreme infection—all but terminal.

Case 2—Mrs. J. H. S.; white; age 29; born in Germany; third child in family of ten.

Diseases of childhood, scarlet fever and measles; no diseases other than these. First menstruation at age of fifteen, twenty-eight day type, duration about one week, flow moderate in quantity and practically painless, always regular, no leukorrhea.

Married at age of twenty-seven. Had some dysmenorrhea after marriage, but period always regular, except once when she went "over" two weeks. Last menstruation, December 25, 1919, or two years and four months after her marriage.

Until about middle of February only symptom of pregnancy noted was increase in the size of breasts. No morning sickness.

About the last of February, she noted a gradually increasing soreness in the right lower abdomen, concerning which she consulted her neighbors, who assured her that in pregnancy "they all had that and more, too."

On March 7, while walking home from church on slippery sidewalk, slipped slightly and felt something "give way" in right abdomen, no sharp pain but soreness increased, and she got home with difficulty. Next morning, having inclination to stool, went into the toilet, bowels did not move, but instead a very severe colic-like pain struck her in the lower abdomen, right side. She felt faint, was in cold perspiration, and got to her bed with much effort. There was no flow at this time. She called her physician, who diagnosed "appendicitis," but as she was pregnant, did not want an operation at this time.

Four days later she began to flow and on the fifth day, Friday, she had very severe

colic-like pains and "passed something from the womb." One of us (Yount), was hurriedly called on the morning of the seventh day after pain began, or third day of flow. Patient in great pain, very anxious expression, very restless, and on going to the toilet, in preparation for examination, became very weak in toilet and required to be carried to bed. Restorative administered. Too tender for satisfactory examination, but a piece of decidual tissue was removed from the vagina, and a diagnosis of "incomplete abortion" made, and patient sent to hospital for operation.

At operation, only small piece of decidua removed from uterus. A careful bimanual examination was not made at the time. (Note: This opportunity for thorough diagnosis will not be omitted again.) The uterus was packed with gauze. The next morning about 4 o'clock, patient had severe pain in right side, sweating and weakness. Nurse told her it was due to gauze pack in uterus. Gauze packing removed. Patient made uneventful convalescence, discharged from hospital on seventh day after admission. Temperature and pulse normal, very scant flow. On morning of March 16, second day after her return from the hospital, or two weeks after first abdominal pain, patient was seized with sharp, cutting pain in lower abdomen, right side. There was muscular rigidity, and tenderness on pressure in the lower right quadrant. Re-admitted to hospital. Temperature 99 degrees, pulse 96, with preoperation diagnosis of "acute appendicitis." Operation disclosed about one pint of clotted blood (mostly old), in abdominal cavity, with ruptured ectopic (tubal) pregnancy right side, and an acutely inflamed appendix. Right tube and appendix removed. Rubber tube drainage. Somewhat slow convalescence due to infection; otherwise good recovery, and excellent health since.

Case 3—Alice N.; age 33; occupation, servant; race, full-blooded Pima Indian. History of antecedents not known.

Patient was married. Had been confined eighteen months before, giving birth to twins, both living. Parturition and post partum period normal. Patient gave no history of previous illness, such as pelvic infections. She had missed one period. October 20, 1920, at about 11:30 a. m., patient went to the toilet, and while there had severe pain in abdomen, causing her to faint. She was assisted to a bed and restoratives administered. About an hour later she started vomiting, still complaining of feeling faint. First saw the patient about 3:00 p. m. Found her to be markedly obese, weighing about 190 pounds. She was in profound shock, very restless, cold, clammy skin, sighing respiration, feeble, rapid pulse, pupils dilated, abdomen tense, tender, showing spasm. Diagnosis of "ruptured tubal pregnancy" with grave prognosis was given husband. Consent was obtained to remove her to the hospital for operation. As soon as she reached the hospital, hypodermoclysis was started and preparations for immediate operation were made. A short time later, as she

was being wheeled into the operating room, she died.

POST MORTEM FINDINGS: Upon opening the abdomen, great quantities of clotted blood and bloody serum were found. The uterus and adnexa were brought into view, showing them to be free from adhesions. There was a left tubal pregnancy at the isthmus, ruptured. Section of the uterus and ruptured tube was made, which showed about an ounce of decidual tissue protruding from the tube into the uterine cavity.

Case 4—Mrs. Z. B. C.; white; age 20; married seventeen months. Usual diseases of childhood. Had typhoid fever five years ago; severe attack of "flu" in 1918.

Began to menstruate at age of fifteen. Twenty-eight day type, duration six or seven days, considerable dysmenorrhea but not constant, no leukorrhea. Dysmenorrhea no more noticeable after marriage than before.

Husband gives history of Neisserian infection three and one-half years before marriage, but repeated microscopic examinations before marriage were negative.

Patient was never pregnant, had missed no periods. March 23, 1921, flow began two days earlier than usual and continued until April 6, when she consulted one of us (Yount).

Examination showed dark, bloody vaginal discharge, not profuse, nor clotted, uterus not enlarged, cervix small, hard, and no dilatation of canal. Uterus retroverted, and right tube slightly enlarged and tube and ovary prolapsed. Patient placed on calcium chloride, ordered to bed, and requested to report in two days, if no improvement. April 9, or 19 days after flow began, no improvement, but a little soreness in lower abdomen. Gentle vaginal examination revealed conditions as at first examination, except that distended, prolapsed right tube was distinctly tender. Removed to hospital, temperature 99, pulse 80. After cleaning out lower bowel, another bimanual examination (third), was made. Nothing new discerned. Uterus was distinctly retroverted and seemed "fixed" and right tube was so tender that patient cried with pain during examination (Douglas sign), which was very carefully and gently made. April 11, patient seen in consultation and examined by joint author of this paper, who confirmed diagnosis. Neither of us considered the tubal condition ectopic gestation.

OPERATION AND OPERATIVE FINDINGS: Dilation and curettage. Uterus $2\frac{3}{4}$ in. in depth, no decidual tissue found. Laparotomy—as soon as the peritoneum was opened, stale disintegrated, brownish-red blood welled into the wound. Uterus and right tube brought up. Tube found distended with blood clot and decidua protruding through rupture. Rupture $1\frac{1}{2}$ c. m. in diameter, about inner third of tube. Tube was slightly tortuous with two spiral twists. It was $7\frac{1}{2}$ c. m. long and the distended spirals 2 c. m. wide. About three ounces of blood in the peritoneal cavity. Right tube and part of ovary removed. Appendix found acutely inflamed, indeed we seldom see more angry appendices in acute conditions. Appendix removed; rubber tube drainage.

THE POSSIBILITIES OF EARLY DIAGNOSIS OF THE TUBERCULOUS KIDNEY

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In the discussion of a paper entitled "The Early Diagnosis of Renal Tuberculosis," read by one of us before this society in March, 1919, the following interesting points were brought out:

The subject is of special interest to us, as we see more than many other communities, due to its association with pulmonary tuberculosis.

That nephrectomy is a life-saving measure, if performed while the disease is unilateral, even when vesical tuberculosis complicates.

That following the appearance of tuberculosis in a kidney, the course is invariably progressive and the period of freedom from infection of the other kidney, while variable, may sometimes be measured in months.

That frequency of urination, especially at night, is perhaps the most constant and characteristic early symptom and in an individual too young for a senile hypertrophy of the prostate should certainly suggest renal tuberculosis.

That pus found in the urine, especially where other bacteria are not demonstrable and especially in an acid urine, should occasion repeated examinations, if necessary, for the tubercle bacillus.

That the best evidence of all, of course, is to find pus and tubercle bacilli in urine from a catheterized ureter.

We may well pause to consider just what constitutes an early diagnosis. Certainly not the complete caseation of the kidney, pelvis and ureter or the pyelonephrotic sac of pus usually seen at operation. Nor can it be called early when the disease is bilateral, or when there is also involvement of the prostate, epididymes or seminal vesicles. Surgical renal tuberculosis begins and develops, according to Edward Keyes, Jr., as a characteristically localized and unilateral disease. Halle and Motz, in a series of 131 post-mortems, found 89 cases of unilateral renal tuberculosis.

The first lesion of chronic renal tuberculosis usually appears near the base of one of the papillae at the upper or lower pole of the kidney; the central portion of the parenchyma is singularly exempt from involvement (Keyes). It is on this presumption that we believe that the method we are now using will demonstrate renal tuberculosis earlier than will any other method. The presumption of renal tuberculosis, based on symptoms alone, does not justify nephrectomy and an exploratory operation will not reveal the condition unless the surface of the organ is studied with tubercles, so that a positive diagnosis necessarily depends on finding both pus and tubercle bacilli in urine from a catheterized kidney pelvis.

The process begins in the kidney from a hematogenous implantation of bacilli from a focus elsewhere in the body. The x-ray will usually show evidence of past or present involvement of the lungs in spite of a negative history. The so-called "arrested" case of lung tuberculosis that develops a pyuria should be examined assiduously. Tuberculosis of the bones and joints are uncommon as original foci of kidney tuberculosis. Quoting further from Keyes we find that, "this first lesion is a characteristic tubercle, crowded with tubercle bacilli. The lesion itself enlarges by extension of round-cell infiltration which ultimately breaks down to form a cheesy nodule or cyst; or if it reaches the kidney pelvis a tuberculous ulcer."

Taking into consideration the size and shape of the normal cavity of the kidney, which consists of the minor and major calyces, and the kidney pelvis, and the fact that renal tuberculosis usually appears near the base of one of the papillae at the upper or lower pole of the kidney (the central portion of the parenchyma being remarkably free from involvement early in the course of

the disease, as mentioned above), we can readily see why this first lesion which is "a characteristic tubercle, crowded with tubercle bacilli" is most likely to involve, or soon communicate with, the kidney cavity, thereby affording the opportunity of finding pus and bacilli in the urine from the affected side; this is the *sine qua non* for nephrectomy.

The degree of tuberculous involvement as indicated by the amount of pus in the urine, is relatively small in lesions of the kidney, compared with tuberculous lesions elsewhere. Consequently, there may be quite a lot of pus, with so few bacilli that repeated slide examinations of stained centrifuged specimens will prove negative in early cases. Except in cases of very extensive ulceration, it is practically a waste of time to look for the bacilli by this method. Recognizing this, we have lately employed the antiformin method as used in the concentration and detection of tubercle bacilli in sputum, with some necessary modifications, in the diagnosis of early renal tuberculosis, with very satisfactory results, as illustrated by the following, which is one of three cases which have proven positive at the first examination.

Case 1. Male, age 51. Eight years ago had bacilli in sputum and came West for his pulmonary tuberculosis. Apparently arrested for past six years, during which time he has had no fever, loss of weight or cough, and was seemingly as well as ever. About eight weeks ago began to get up about twice each night to void. Four weeks ago noticed a slight burning on urination and his physician found pus in the urine. Has had no blood in the urine and no pain. Catheterized specimen from bladder showed an acid urine, a moderate amount of pus, positive albumen, and an antiformin concentration showed a few clumps of tubercle bacilli. Cystoscopy revealed nothing abnormal in the bladder except a localized inflammation of moderate degree around the right ureteral orifice. Catheterized specimens were obtained from each kidney pelvis; the left proving normal except for a slight trace of albumen; the right showing albumen, pus and clumps of tubercle bacilli with the antiformin concentration. Phenolphthalein appeared in three minutes from each side and each kidney eliminated 10 per cent in ten minutes. At operation, there was no evidence of peri-nephritic inflammation, either past or present, no en-

largement of the kidney or tubercles visible on the surface, no pebbling or sclerosis of the ureter and we appeared to be removing a normal kidney. On sectioning the kidney after nephrectomy, we found a tuberculous cavity, the size of a small pea, communicating with the lower portion of the upper major calyx, a few millet-sized tubercles on a papilla in the lower pole and a few suspicious nodules grouped around a lower minor calyx. The rest of the organ was macroscopically negative.

We do not recall having seen a tuberculous kidney come to operation with as little destruction as this one.

The antiformin method is a procedure for detecting tubercle bacilli in any suspected material where the organisms are few in number. It is based on the fact that the tubercle bacillus will withstand chemical action sufficiently active to destroy mucus, pus and other bacteria, without itself being destroyed or even losing its staining characteristics. Antiformin consists of two solutions, "A" and "B". Solution "A" is a ten per cent solution of sodium hypochlorite and solution "B" is a fifteen per cent solution of sodium hydroxide. As ordinarily employed with sputum, twenty c. c. of sputum are diluted to sixty-five c. c. with sterile distilled water and 15 c. c. of antiformin (equal parts of "A" and "B"), added. Working with these dilutions as a basis, it is readily applicable to urine sediment. Even in very early tuberculosis of the kidney, there is usually an abundance of pus, though the organisms may be scanty. In such a case, the urine may be saved for several hours and allowed to stand until the pus settles to the bottom of a cone-shaped container and the supernatant urine poured off, or it may be centrifuged, a tube full at a time, each time saving the sediment and pouring off the supernatant urine, until all the pus is collected. It has been found that 15 c. c. of antiformin, diluted with 90 c. c. of sterile distilled water, will destroy this sort of pus, together with the small amount of mucus usually present, in one hour at incubator temperature. The sediment is then collected by centrifuging, washed several times with normal salt solution, spread on a slide and stained in the usual manner for tu-

bercle bacilli. The only precaution necessary is to have the antiformin of such a strength that the tubercle bacilli will not also be destroyed.

We believe that the antiformin method is a valuable procedure in this connection and one not generally applied. On looking over available literature, reference is made to slide examinations of urine sediments for tubercle bacilli but no mention is made of the concentration method. Slide examinations are spoken of as extremely valuable when the organism can be found, but are passed up with such a statement as the proverbial saying, "it is like looking for a needle in a haystack." There are possibly two reasons why this method is not more widely used: one is the inconvenience experienced in the preparation of antiformin and its instability, and the other is a prevailing feeling of uncertainty on the part of the examiner, when acid-fast bacilli are found in urinary sediments, as to whether they are tubercle bacilli or smegma bacilli, the latter being saprophytic organisms commonly found on the external genitalia and are also acid-fast.

Sodium hypochlorite is an unstable compound and decomposes in a few weeks, even in amber colored, glass-stoppered bottles. Difficulty is experienced when it is prepared from chlorinated lime, as a source of chlorine, because that substance is also more or less unstable. The most satisfactory source of chlorine is from drums of the liquid. From this the gas is measured through a gasometer, and delivered into a sodium carbonate solution in such quantity as to yield a sodium hypochlorite solution of required strength. It can be prepared fresh at any time and with little trouble, by this method.

Confusion of *B. tuberculosis* and *B. smegmae* can be avoided by a careful collection of the specimen. *B. smegmae* is non-pathogenic and is never found inside the urethra. If the patient is a man, it is unnecessary even to catheterize when searching bladder urine. The penis and especially the glans, should be washed with green soap and finally rinsed with a weak bichloride

solution before urinating. The first few c.c. of urine to pass should be discarded and the rest collected in a sterile container. Any organisms found in this specimen can be safely regarded as coming from the bladder. If the patient is a woman, further precaution is necessary. The vulva should be carefully washed with green soap and finally rinsed with boric acid solution. Preferably a glass catheter should then be introduced, being careful to touch nothing but the external orifice of the urethra. Specimens secured from catheterized ureters can be safely regarded as free from the smegma bacillus. If these precautions have been properly observed, no differentiation is necessary, but in the event they have not, a differentiation may still be made by decolorizing the stained smear for one hour in acid-alcohol. *B. smegma* will be decolorized while the bacillus of tuberculosis will retain the stain. It is said that *B. smegma* will sometimes withstand this test, but when it does so, it is stained so faintly as to be easily differentiated.

In three out of four cases recently examined by this method, tubercle bacilli have been demonstrated at the first examination. Failing to demonstrate the organism by this means, a guinea-pig, or better, several guinea-pigs, may be inoculated. But by animal inoculation, at least three weeks is required to make a diagnosis. This causes unnecessary delay in many cases in which the time is valuable. If the organism is not demonstrated by one examination, several can be made and, if present, will be found.

We realize that in cases of occluded renal tuberculosis and in isolated tuberculous foci in the parenchyma, this method will not demonstrate bacilli for the reason that they are not procurable from a catheterized ureter. However, these are the rarer forms of the disease; the great majority of cases of tuberculous kidney have both pus and tubercle bacilli in the urine very early, frequently before any symptoms, other than a frequency of urination.

CONCLUSIONS.

1. We see a relatively larger number of tuberculous kidneys than do other communities.
2. It is of extreme importance, from a surgical standpoint, to make the diagnosis early in the course of the disease.
3. The antiformin concentration method is a distinct improvement over methods commonly used for the early

detection of the tubercle bacillus in urine.

4. The majority of cases of renal tuberculosis involve or soon communicate with the kidney pelvis, making a diagnosis possible, early in the course of the disease.

5. Every case of pyuria, especially with a history of active or arrested pulmonary tuberculosis, should be considered a possible case of renal tuberculosis, until proved otherwise.

BLOOD CHEMISTRY WITH A REPORT OF FIFTY EXAMINATIONS.*

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Blood Chemistry, or the chemical examination of blood, is thought by far too many to belong only to the research laboratory, where experimental physiological chemistry is done by research workers, and until Folin brought out his epoch-making work placing blood chemistry on a practical working basis, blood chemistry was not available for the physician in making a diagnosis.

Since Folin published his work, blood chemistry is or should be available to anyone desiring to use the chemical contents of the blood as aids in diagnosis.

At present a blood chemical analysis is no more difficult than urinalysis, gastric content analysis or blood counting. A careful technician who is good at matching colors can, in a few days, do good work by following the outlined technic carefully.

The quantity of blood required has been brought down to a small amount; ten cubic centimeters is ample, and if necessary the estimations can be done with five cubic centimeters of blood, or even less if it is absolutely necessary. This makes it easy since few patients will object to giving this amount of blood.

Other workers besides Folin have done much to improve and simplify the technic, viz: Denis, Myers, Fine, Benedict, Lewis and many more far too numerous to mention, as a review of the literature would take far too long.

For clinical purposes the blood is examined for non-protein nitrogen, urea nitrogen, creatinine, creatin plus creatinine, blood sugar and uric acid. In many conditions such as impaired kidney function, diabetes, arthritis and gout, chemical examination of the blood is very helpful in diagnosis and prognosis. I believe it is more helpful than any of the other laboratory examinations.

In one hundred cubic centimeters of whole blood of a normal healthy person, there is an average of 25 to 35 milligrams of non-protein nitrogen, 12 to 15 milligrams of urea nitrogen, 1 to 2 milligrams of creatinine, 6 milligrams of creatin plus creatinine, 80 to 120 milligrams of blood sugar and 2 to 3 milligrams of uric acid.

I have been asked a great number of times if a careful urinalysis does not give as much information as a

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chemical examination of the blood. My answer is, "it does not." Both are of great value, but blood chemical examinations are of very much more value than urinalysis as I will point out in some of my cases.

Many diabetics who have large amounts of sugar in their urine have a lower blood sugar content than cases with no glycosuria, but having a hyperglycemia, showing that glycosuria depends on the permeability of the kidney to sugar. A striking demonstration of this is shown by the injection of phlorizin (one gram per kilo of body weight) producing "phlorizin diabetes," the urine containing as high as ten per cent sugar with no increase in blood sugar content.

When there is a faulty elimination of the nitrogenous waste matters, uric acid is always the first to be retained in the blood, non-protein and urea nitrogen next and creatinine last.

An increase of uric acid which remains constant is always found in patients with gout, while in other joint conditions an increase may or may not be found. In arthritis there is an increase of the other non-protein nitrogenous elements of blood as well as an increase of blood sugar, although the increase of uric acid is inconstant.

In nephritis there is an increase of non-protein and urea nitrogen, uric acid and creatinine. Creatinine is the most important of these in prognosis as a marked increase to one hundred per cent or more is considered by many to indicate a fatal termination in a short time. The

other nitrogenous elements may be increased to a much higher percentage than creatinine without so grave an outlook for the patient.

For my report I have taken the first fifty examinations done in my laboratory in rotation from January 1, 1921. These were examinations of the blood of forty-three patients, two having three examinations and three having two examinations. Of these persons thirty-five were females, fifteen were males. The youngest patient examined was twenty-three years of age, the oldest was seventy-six years, the average being slightly over forty-nine years. The conditions diagnosed were as follows:

Myocarditis, six cases; myocarditis complicated with nephritis, four cases. Nephritis, seven cases; nephritis complicated with myocarditis, four cases; nephritis complicated with arthritis, four cases; nephritis complicated with angina pectoris, one case. Arthritis, ten cases; arthritis complicated with nephritis, four cases; arthritis complicated with colitis, one case. Colitis, five cases; colitis complicated with arthritis, one case. Undernourished, five cases. Auricular Fibrillation, one case. Hyper-thyroidism, one case. Diabetes, two cases. Toxic Encephalitis, two cases.

In these fifty examinations the quantity of each element per one hundred cubic centimeters of whole blood was as follows:

	Highest	Lowest	Average
Non-protein Nitrogen	98.40	7.5	31.40
Urea Nitrogen	81.00	4.8	19.66
Creatinine	6.00	0.5	1.98
Creatin plus Creatinine	13.20	3.6	7.18
Blood Sugar	400.0	23.0	122.10
Uric Acid	11.12	1.1	4.42

The six cases of Myocarditis showed:

	Non-Protein Nitrogen	Urea Nitrogen	Creatinine	Creatin plus Creatinine	Blood Sugar	Uric Acid
Highest	39.0	19.95	3.0	10.6	133.0	3.3
Lowest	15.21	7.05	1.2	5.0	102.0	2.0
Average	27.8	14.5	2.1	7.5	110.7	2.6

In these cases of myocarditis the average of non-protein nitrogen, urea nitrogen, creatinine and uric acid are within normal limits while creatin plus creatinine is high. This average was brought up by two cases,

numbers 20 and 49, both of which had over ten milligrams of creatin plus creatinine. They are probably nephritics, but show no albumen or casts so were not classed as such in my diagnosis.

The sixteen cases of Nephritis showed:

	Non-Protein Nitrogen	Urea Nitrogen	Creatinine	Creatin plus Creatinine	Blood Sugar	Uric Acid
Highest	98.4	81.0	6.0	12.3	400.0	11.0
Lowest	17.1	4.8	.5	4.0	23.0	1.3
Average	36.3	22.9	1.1	6.7	129.1	4.8

In these cases of nephritis there is a wide variation in the blood findings. This shows that where the kid-

neys are involved there is a wider variation of the blood findings than in any other condition in this series.

The five cases of Undernourishment showed:

	Non-Protein Nitrogen	Urea Nitrogen	Creatinine	Creatin plus Creatinine	Blood Sugar	Uric Acid
Highest	30.9	18.0	3.0	8.3	117.0	8.25
Lowest	20.0	12.0	.8	4.8	50.0	1.1
Average	26.1	11.6	1.7	6.0	79.6	3.6

In these five cases all of the blood findings are low except creatin plus creatinine and uric acid. The high creatin plus creatinine is probably

due in these cases to the fact that the body muscles are being depleted in keeping with the amount of these constituents in the blood.

The fifteen cases of Arthritis showed:

	Non-Protein Nitrogen	Urea Nitrogen	Creatinine	Creatin plus Creatinine	Blood Sugar	Uric Acid
Highest	81.0	81.0	5.0	12.3	200.0	9.0
Lowest	7.5	9.9	.8	3.6	97.0	2.0
Average	33.1	25.1	2.1	7.6	129.3	5.4

These fifteen cases of arthritis show a wide variation in all the blood findings and an increase in all except non-protein nitrogen, the urea nitrogen and uric acid being increased proportionately more than the other blood findings.

The two cases of Diabetes showed:

	Protein Nitrogen	Urea Nitrogen	Creatinine	Creatin plus Creatinine	Blood Sugar	Uric Acid
Highest	57.0	36.0	2.6	11.2	360.0	11.1
Lowest	20.1	28.0	1.6	5.9	300.0	4.3
Average	38.6	32.0	2.1	8.6	330.0	7.7

These cases show an increase in all the blood findings except creatinine.

The six cases of Colitis showed:

	Non-Protein Nitrogen	Urea Nitrogen	Creatinine	Creatin plus Creatinine	Blood Sugar	Uric Acid
Highest	36.0	19.5	2.4	9.6	170.0	8.0
Lowest	18.0	9.9	.8	4.1	87.0	2.5
Average	28.5	14.1	1.6	6.5	110.3	4.6

In the cases of colitis the average of the blood findings are within normal except uric acid, which is about fifty per cent increased.

Case 1. Case number 28 of the series, Miss C., thirty-two years of age, came under my care in May, 1919. She was single, without occupation. She was born prematurely at seven months, and weighed three pounds. She was frail and under normal until six years of age, when she began to build up and developed into a normal healthy person. She had concussion of the brain at seven years of age from an accident, but no other illnesses. Menstrual periods began at twelve years of age, and were normal with the exception of being occasionally scanty. She underwent appendectomy in April, 1916, with good recovery.

The complaint for which she consulted me was attacks of dizziness, poor sleep and discomfort across lower abdomen.

The physical examination was negative except for tenderness in the cecal region and over the sigmoid. Heart sounds were clear, only about one-half the normal quality. The pulse rate was eighty per minute. The blood pressure was, diastolic thirty, systolic eighty-five.

Urine examination was negative. Feces examination showed mucus and much undigested food.

Diagnosis: Mucous Colitis.

On a proper diet she improved, although, as in most cases of this kind, she would eat indiscreetly when she was free from pain, and bring on another attack. This condition has continued for the two years I have been looking after her.

In June, 1921, she began to have severe pains in the back of her neck and left

shoulder which were so severe that she felt compelled to move her head and shoulder nearly all the time in the attempt to relieve the discomfort. A chemical examination of her blood showed: Non-protein nitrogen, 25.2; urea nitrogen, 9.9; creatinine, 0.75; creatin plus creatinine, 5.1; blood sugar, 170.0; and uric acid, 3.85 milligrams per one hundred cubic centimeters of blood.

From these findings I was satisfied that her condition came from focal infection. Unable to find any infection elsewhere, I insisted on an x-ray of her teeth being taken (even though she had recently had her teeth looked over and a partial lower denture made), with the result that there was found a small fragment of the posterior root of the right lower second molar with an abscess cavity around it. On careful examination of her gums, I found a small sinus leading to the pus sac. I had the offending piece of tooth removed and a month later the pain began to lessen and entirely disappeared in three months. Since that time there has been no recurrence.

Case II. Examinations numbers 2, 4 and 9 are of one patient, Mrs. S., age seventy-one, married. I saw her in consultation January 17, 1921. She complained of severe headaches, inability to take food, severe pains in the region of her heart and inability to move in bed without bringing on a heart attack, as she called it.

The physical examination showed her to be very much emaciated, with dry and harsh skin, a tongue coated and very dry and the odor of apples on her breath. Lung examination was negative. The heart sounds were clear and loud. The pulse was 200 per minute. On so slight an exertion as turning over in bed the pulse would become too rapid to count. The blood pressure was, diastolic 130, systolic 200. On account of the gravity of the situation, I sent her to the hospital.

The chemical examination of the blood of January 18, 1921, showed: Non-protein nitrogen, 7.5; urea nitrogen, 4.8; creatinine, 6.0; creatin plus creatinine, 9.6; blood sugar, 24.0; uric acid, 5.75 milligrams per one hundred cubic centimeters of blood. From the above findings and the fact that several authors claim that a creatinine content of 5.0 milligrams is indicative of an early fatal outcome, I decided to use heroic treatment in an attempt to increase the elimination.

She was given sixteen ounces of buttermilk with the addition of sugar or corn syrup, every three hours, water as much as she could take, Murphy drip constantly, hot packs twice a day and enough magnesium sulphate to produce free catharsis.

Urine examination on admission showed:

Amount in 24 hours, 900 c. c.; specific gravity, 1013; albumen, trace; no sugar; no casts; an occasional red blood cell. Daily output of urine from January 19 to February 8, 1921, was as follows: January 19, 900 c. c.; 20th, 720 c. c.; 21st, 1080 c. c.; 22d, 1770 c. c.; 23d, 1920 c. c.; 24th, 2550 c. c.; 25th, 2070 c. c.; 26th, 1350 c. c.; 27th, 1680 c. c.; 28th, 2580 c. c.; 29th, 1590 c. c.; 30th, 1860 c. c.; 31st, 1500 c. c.; after which date the total amount was not again measured until February 8, when it was 2250 c. c.

Blood chemical examination of January 28, 1921, showed: Non-protein nitrogen, 30.0; urea nitrogen, 8.5; creatinine, 1.0; creatin plus creatinine, 6.0; blood sugar, 400.0; uric acid, 7.17; milligrams per one hundred cubic centimeters of blood, showing an increase in non-protein nitrogen, urea nitrogen, blood sugar and uric acid, with a marked decrease in creatinine and creatin plus creatinine. Owing to the tremendous increase in blood sugar the sugar was omitted in her diet.

The chemical examination of the blood, of February 8, 1921, showed: Non-protein nitrogen, 17.14; urea nitrogen, 12.0; creatinine 3.0; creatin plus creatinine, 5.0; blood sugar, 110.0; uric acid, 3.3 milligrams per one hundred cubic centimeters of blood. This examination showed that her blood chemical elements had become near to normal.

On January 20, 1921, her pulse rate was 118 per minute. The blood pressure was, diastolic 120, systolic 190. On January 28, 1921, her pulse rate was 76 per minute. The blood pressure was, diastolic 100, systolic 150.

On February 8, 1921, her pulse rate was 70 per minute. The blood pressure was, diastolic 90, systolic 140.

Her condition was so much improved that on February 9, 1921, she left the hospital and returned to her home with the instructions to take one light meal and two quarts of buttermilk daily.

She has reported to me frequently since leaving the hospital. On two occasions she ate too heartily of heavy food. Once she ate baked beans, which brought on an irritability of her heart. In a day or two after discontinuing the heavy foods she became comfortable. She is now able to take reasonable motor rides and assist with her housework.

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Normals		Milligrams per 100 C. C. Whole Blood.							Urine, Examinations of 24-Hr. Specimens.							Diagnosis.	
		25-35	12-15	1-2	6.0	80-120	2-3	C. C.	Sp.	Grams	Grams	Blood					
Series.	Age.	Sex.	Non-Prot. Nit.	Urea Nit.	Creatinine.	Creatin Plus Creatinine.	Blood Sugar.	Uric Acid.	in 24 hrs.	Gr. Albumen	of Sugar	of Urea	Cast	Pressure D. S.			
1	43	M	15.21	12.45	3.0	5.4	133.0	2.0	2000	1030	Ft. trace	0	33.0	0	90-110	Myocarditis	
2	71	F	7.5	4.8	6.0	9.6	24.0	5.75							130-200	Nephritis	
3	23	F	30.0	9.9	3.0	6.6	50.0	8.25	1440	1008	0	0	8.1	0	70-110	Undernourished	
4	71	F	30.0	8.5	1.0	6.0	400.0	1.17							120-190	Nephritis	
5	50	F	7.5	10.0	5.0	8.0	100.0	6.2	1250	1008	0	0	11.25	0	80-150	Arthritis	
6	40	M	18.75	10.0	2.0	4.8	125.0	2.5	480	1020	Trace	0	4.80	Few Hyal.	60-110	Auricular Fibrillation	
7	50	F	20.0	7.5	2.7	5.0	105.0	3.3	5000	1006	0	0	12.0	0	80-115	Myocarditis	
8	45	F	18.75	15.0	3.0	6.6	110.0	3.12	3000	1016	0	0	37.8	0	90-145	Arthritis	
9	71	F	17.14	12.0	3.0	5.0	110.0	3.30							90-140	Nephritis	
10	57	F	20.0	16.66	2.0	6.6	100.0	4.1	2000	1010	0	0	19.20	Hyal. Gran.	125-190	Arthritis	
11	44	F	24.0	12.5	1.8	5.4	125.0	2.5	800	1018	0	0	13.92	0	90-130	Mucous Colitis	
12	72	F	30.0	14.2	2.5	4.8	142.0	3.3	960	1022	Trace	0	16.20	Hyal. Gran.	90-200	Myocarditis and Nephritis	
13	67	F	30.0	10.0	2.1	6.6	133.0	5.0	600	1020	Trace	0	12.78	Hyal.	160-240	Nephritis and Angina Pectoris	
14	63	F	24.0	12.0	1.7	5.0	117.0	3.5	450	1022	0	0	6.75	0	100-120	Undernourished	
15	51	M			.5	6.0	23.0	1.6	1000	1020	Trace	0	17.10	Hyal. Gran.	120-180	Myocarditis and Nephritis	
16	70	F	20.0	12.0	.75	4.8	50.0	1.1	1620	1016	0	0	14.40	0	90-110	Undernourished	
17	36	M	20.0	12.0	.7	5.5	86.0	1.4	1200	1010	0	0	16.56	0	90-130	Hyper-throid	
18	72	M	22.5	10.0	1.1	6.1	80.0	1.28	1860	1008	Ft. trace	0	8.10	Hyal.		Nephritis	
19	23	F	30.0	18.0	1.14	5.4	88.0	2.89								Undernourished	
20	50	F	39.0	19.5	1.9	10.2	108.0	2.37	2200	1010	0	0	8.4	0	70-110	Myocarditis	
21	58	F	45.0	22.5	2.1	10.8	113.0	2.4	2000	1010	0	0	15.60	0	150-200	Nephritis	
22	50	F	37.2	14.5	1.5	3.6	126.0	4.6							80-150	Arthritis	
23	34	M	42.0	16.95	1.6	4.1	94.0	4.0	1100	1016	0	0	14.85	Few Hyal.	90-130	Colitis	
24	50	F	36.0	19.05	2.4	9.6	87.0	4.8	2200	1014	Trace	0	19.8	Few Hyal.	80-130	Colitis	
25	38	M	39.0	17.0	1.01	5.52	89.0	4.12	800	1022	0.5 per L.	0	15.12	F. Gran.	100-120	Myocarditis and Nephritis	
26	32	F	29.8	12.75	1.18	6.42	108.0	2.9	1200	1012	0	0	13.6	F. Gran.	70-100	Myocarditis	
27	57	M	27.6	17.5	1.66	4.0	160.0	4.8	800	1020	Ft. trace	0	10.32	Hyal.	80-140	Arthritis and Nephritis	
28	32	F	25.2	9.9	.75	5.1	170.0	3.85	1500	1016	Ft. trace	0	19.25	0	30-85	Arthritis and Colitis	
29	33	F	27.0	15.75	1.2	6.78	108.0	2.62	2000	1010	0	0	23.4	0	70-105	Myocarditis	
30	53	F	18.0	12.5	1.27	7.02	90.0	4.25	1300	1008	0	0	7.02	0	100-145	Colitis	
31	49	M	30.6	19.5	1.56	8.7	122.0	4.65								Arthritis	
32	40	F	64.2	72.0	2.5	7.2	108.0	8.5	1300	1016	0	0	13.65	0	80-120	Arthritis	
33	36	M	57.0	28.0	1.57	5.88	360.0	11.12	1300	1032	0	17.29	30.4	Hyal.	80-120	Diabetes	
34	52	M	98.4	75.0	1.32	5.85	120.0	11.0	800	1014	0	0	7.44	Hyal.	80-120	Myocarditis and Nephritis	
35	76	M	81.0	81.0	1.14	4.70	155.0	6.68	800	1022	0	0	12.48	Hyal. Gran.	90-160	Arthritis and Nephritis	
36	65	F	24.0	24.3	2.04	4.56	200.0	4.25	900	1018	Ft. trace	0	18.36	Hyal. Gran.	70-160	Arthritis and Nephritis	
37	38	F	28.5	19.35	2.34	7.8	100.0	4.68	1500	1026	0	0	30.6	0	70-110	Toxic Encephalitis	
38	31	F	27.0	13.5	2.34	6.9	100.0	5.23	1700	1010	Hy. trace	0	15.3	Hyal.	110-160	Nephritis	
39	29	F	22.4	13.8	1.74	8.1	100.0	3.07	1700	1010	0	0	20.4	0	70-110	Acidosis	
40	23	F	30.9	16.2	1.81	8.3	83.0	2.1								Undernourished	
41	38	F	27.0	24.0	2.4	13.2	107.0	6.1							75-115	Toxic Encephalitis	
42	38	F	28.2	11.7	1.1	12.3	121.0	8.0	800	1014	Ft. trace	0	10.08	F. Gran.	75-105	Arthritis and Nephritis	
43	41	F	17.28	16.05	1.21	10.5	97.0	9.0	1900	1010	0	0	15.96	0	90-130	Arthritis	
44	56	M	20.1	36.0	2.62	11.16	300.0	4.25	1100	1034	0	6.82	19.14	Gran.	100-150	Diabetes	
45	61	M	16.5	30.0	2.85	9.6	108.0	5.25	2000	1010	0	0	17.8	0	75-110	Arthritis	
46	57	F	25.8	18.3	1.85	7.8	96.0	8.0	1300	1008	0	0	8.58	Hyal.	80-130	Colitis	
47	50	F	27.0	21.0	1.95	7.92	100.0	2.70	2000	1012	0			Hyal.	110-190	Nephritis	
48	64	F	35.0	16.65	2.49	10.95	122.0	2.0	1800	1010	0	0	5.94	Hyal.	80-150	Arthritis	
49	55	M	35.7	19.95	2.29	10.62	102.0	2.42	2100	1012	0	0	18.9	0	90-145	Myocarditis	
50	50	F	53.4	21.9	2.26	10.8	141.0	3.12	400	1023	0	0	8.28	8	70-120	Arthritis	
Average			31.4	19.66	1.98	7.18	122.1	4.42									

In the above table the blood of the same patient is represented in series numbers 2, 4, 9, of another patient in series numbers 3, 19, 40, of another patient in series numbers 5, 22, of another patient in series numbers 7, 20, of another patient in series numbers 37, 41.



FETAL DYSTOCIA FROM FAULTY ATTITUDE AND FAULTY POSITION*

HARRY A. REESE, M. D., Bisbee, Arizona.

In the conservation of human life and the prevention of suffering, there is no better field than that of obstetrics. The able and conscientious obstetrician is of inestimable value to the nation and the race. Without his kindly help many more lives would be permanently lost, and much more suffering would befall motherhood. In normal labor all may go well under the care of the old Mexican "Granny", who hangs the image of San Gonzalo on the wall and dances around the room while bowing to the image and singing:

"San Gonzalo de mi amor,
Con un paso crusa el mar;
Hágame este milagro, Santo,
Y le prometo bailar."

Which means in English:

"Saint Gonzalo of my love,
With one step you cross the sea;
Do me this favor Saint,
And I promise to dance to Thee."

I say in normal labor all may go well, but not so in pathological labor. But there is one thing to be said in favor of the ignorant midwife: she has no hypodermic syringe loaded with pituitrin.

Pathological labor or dystocia is one which departs from the conditions of physiological labor. According to Edgar's classification, fetal dystocia may be due to: (1) faulty attitude; (2) faulty presentation; (3) faulty position; and (4) general fetal conditions. In this short paper we will not consider maternal dystocia. Faulty attitude or position of the fetus may be caused by anything which alters the normal shape of the fetal ovoid. Thus dystocia may be due to a faulty attitude caused by any deviation of the fetal head from the normal position of flexion.

According to the degree of extension present will be the variety of the malpresentation which will result. I need only mention these malpositions to refresh your memory, and no doubt you will recall some poor mother who suffered long and patiently before your kindly help was offered. 1. Excessive flexion of the head. 2. Bregma presentation (incomplete flexion). 3. Brow presentation. 4. Face presentation. 5. Presentation of anterior parietal bone or ear. 6. Presentation of posterior parietal bone or ear. 7. Prolapse of the arms. 8. Prolapse of the leg. 9. Prolapse of the cord. 10. Pelvic presentation. 11. Shoulder presentation. 12. Persistent occipito-posterior position. 13. Persistent mento-posterior position. 14. Transverse engagement of head in inlet in deformed pelvis. 15. Transverse position of head at outlet. 16. Multiple birth. 17. Multiple or compound presentation. 18. Malformations and deformities, etc., etc.

Wholly unnecessary, for the purpose of this short discussion, to describe each of these malpositions separately. Far be it from me to accuse any one of you gentlemen with the sin of ignorance, but I do accuse myself and others with the sins of carelessness. I do believe we make nine mistakes from carelessness where we need to make one from ignorance. In our obstetric work so many cases are normal that some of us just get careless. We seem to think: "Everything is all right. She's just a little slow that's all. If she does not do better after a few hours, I will give her a little pituitrin." A few more hours of needless suffering, and a shot of pituitrin, and the poor helpless parturient woman goes wild, and if, as too often occurs, there is some mechanical obstruction to delivery she may die from a rupture of the uterus. If not, after all this heartless cruelty, the attending physician may for the first

*Read before the Cochise County Medical Society, at Bisbee, Arizona, in March, 1922.

time take the pains to make a correct diagnosis of presentation.

I had attended approximately one thousand deliveries before I realized the frequency of occipito-posterior positions. How common they are may be indicated when I state that I found ten cases in the last one hundred deliveries which I attended just previous to this date (January 20, 1922). How many of these one hundred cases began labor with the occiput in the posterior position, and in which anterior rotation took place may be estimated by remembering that Edgar estimates that 20 per cent of all vertex presentations are occipito-posterior, at the beginning of labor, and DeLee believes that 29 per cent is more nearly correct. However, it is claimed that less than 5 per cent become impacted in the hollow of the sacrum.

DeLee says that 20,000 women die every year in our country from the effects of childbirth, and that nearly every mother carries the marks of injury inflicted during labor, and that 100,000 infants are annually lost during delivery. If a physician can not, or will not, lessen this mortality, pain, and injury, what is he good for, anyway?

My plea is for more painstaking care, that all malpositions may be diagnosed and corrected early in labor, that hours of suffering may be saved the parturient woman, and that the mortality rate of both mother and child may be lessened. One can usually arrive at a correct diagnosis of occipito-posterior position without making a vaginal examination. How? By finding the fetal heart sounds nearly always, in 17 cases out of 20, on the right side of the mother, and above the anterior superior spine of the ilium early in labor, and slowly descending as labor progresses until it is faintly heard just above Poupart's ligament, low down in the mother's flank. Also you may note a hollow above the pubis. Of course, you wish to confirm your diagnosis by vaginal examination. By palpating the large, or anterior, fontanel, under the pubic arch, and the small fontanel deep down on the rectum. Owing to the usually large caput suc-

cedaneum, it is not always easy to outline the sutures, and, under these difficulties, the fingers are to be passed along side the fetal head until the ear can be grasped between two fingers. If the external ear is found pointing toward the mother's spine, your diagnosis is complete.

So the first important point is an early diagnosis that the mother may be saved hours of needless suffering. And that is not all. Turning the child is easy before the head is engaged. This is not so after the head, and body as well, are impacted in the bony pelvis. And the operation is doubly difficult if pituitrin has been given. Left to nature, a persistent occipito-posterior position is an almost impossible delivery. The child's neck is long enough in the anterior position to pass under the arch of the pubis, but in the posterior position, the three-inch neck can not traverse the five inches from the promontory of the sacrum to the tip of the coccyx, and the five more inches from the tip of the coccyx to the edge of the distended perineum without the body of the child passing into the pelvis with the head. In this way we have the fetal diameter almost doubled. What mother can possibly overcome such difficulties? I call such a position "impossible;" and that has been my experience with these unfortunate cases. But if the physician is called early, makes his diagnosis early, and corrects the malposition early, all is well.

The *treatment* is *rotation*. While it is true that in the larger percentage of cases anterior rotation does take place spontaneously after hours of pain, in my humble opinion I would no more advise you to wait for nature to correct the malposition, than I would advise you to wait for nature to "cure" a case of acute appendicitis. I would waste no time for spontaneous rotation. I would waste no time with the woman in the knee-elbow position, or in the exaggerated lateral position. Neither would I depend upon external manual rotation alone; but, under ether anesthesia, I would introduce my whole hand into the vagina and my fingers

under the child's head and anterior to the shoulder. I would not grasp the shoulder, nor the body, but I would push the shoulder down toward the mother's hip on the side toward which the child's back rests. That is usually toward the mother's right hip. At the same time I use my left hand externally to turn the body of the child. Having pushed the baby's right shoulder down and toward the mother's right hip, I now turn the child's head either by grasping the head or by making pressure back of the ear, and at the same time lifting up on the back of the head. I prefer to turn the body first and then to grasp the head between my thumb on one side and my fingers on the other and turn the head with the occiput anterior, and then flex the head and hold it in position for a pain. The ether is now withdrawn, and the head is held flexed and in the anterior position until a pain or two engages the head in the pelvis. As a rule I am able to do this little trick without the rupture of the membranes. The membranes should not be ruptured unless it becomes necessary to apply forceps and deliver. I admit that my hand is very long, narrow, and flexible.

However, if you feel that your hand is too large for the manual rotation, you may follow the method of forceps rotation, as taught by Edgar, and others. I much prefer my hand. Just now I recall a case of occipito-posterior position in which, without an anesthetic, I very gently introduced my hand and grasped the fetal head, waited until the pain was over and the uterus had

relaxed, then I quickly pushed the head up and rotated and flexed it before the uterus had time to again contract. Two more pains delivered the baby's head.

NEWS ITEMS

The Maricopa County Medical Society held its final meeting for the season at the Adams Hotel, Thursday evening, May 19th. A dinner preceded the formal meeting, and was well attended by about fifty members and guests. Among the latter were Drs. Brooks and Loewy, of the U. S. Venteran's Hospital No. 50, at Prescott. Brief talks on the subject of the importance and functions of a county society were made by Drs. Smith, Watkins and Brockway.

At the scientific meeting, papers were presented by Drs. Haines, McLoone and Watkins. These three papers are the same as the corresponding speakers will present before the coming Arizona State Medical Association meeting, in Prescott and Jerome.

Moving pictures, showing the technic of Beck paste injections, and of an operation upon the upper jaw by Albee, preceded the papers.

Arizona Men at El Paso—Among the visitors and guests at the Texas State Medical Association meeting at El Paso were Dr. and Mrs. C. A. Thomas, of Tucson; Dr. H. A. Reese, of Bisbee, and Dr. Warner Watkins, of Phoenix.

Dr. H. P. Mills—Among the doctors who attended the American Medical Association meeting at St. Louis, was Dr. H. P. Mills, of El Paso, who also attended the meetings of the Radiological Society and the Radium Society, spending a few additional weeks in studying radiotherapy in the clinics of St. Louis.

Dr. John W. Flinn—The delegate from Arizona to the American Medical Association meeting at St. Louis, was Dr. John W. Flinn, of Prescott. An interesting report is expected from Dr. Flinn, at the forthcoming meeting in Prescott, regarding the reported threatened split in the Association over certain policies of the organization.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

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THE ARIZONA STATE MEDICAL ASSOCIATION MEETING

The program which the Arizona State Medical Association will present, at Prescott and Jerome, on the 14th, 15th and 16th of this month, will be a notable achievement in the history of that organization.

In the first place, the Association, for the first time, will attempt a program which extends over three days. The Program Committee had this point under careful consideration, and finally concluded that the excellence of the program would justify this innovation. Very few of the state meetings are concentrated into two days, and, when the material is available, those who attend the Association at all should be glad to spend three days.

In the second place, a dual meeting will be held, in order that the two principal cities of Yavapai County may share in the privilege of entertaining the Association, and for the reason—more important to the members attending—that we may have the privilege of seeing both these cities, only thirty miles apart by auto, but in such different natural settings and of such different types of industry, that it will be like passing from one state into another. The beautiful auto highway now connecting these two cities makes this ar-

rangement possible and altogether desirable, and the features of this arrangement will be highly pleasing and entertaining to those attending the meeting.

The program, as a whole, speaks for itself, but a word or two in explanation may interest those who are not acquainted with the expected visitors.

The Address in Medicine is to be given by Dr. Walter D. Sheldon, of the Mayo Clinic. Dr. Sheldon will be remembered as a former visitor to our Association several years ago, at that time addressing us on lung and pleural diseases.

The Address in Surgery will come on Friday and will be given by Dr. Clarence Moore, of Los Angeles, who is well known throughout Arizona, but comes to our Association for the first time, at least within my recollection.

On Wednesday afternoon, Dr. Max Rothschild, of San Francisco, will speak on the specific treatment of tuberculosis with partial antigens. Dr. Rothschild is one of the pioneers in tuberculosis work, especially in specific treatment and in pneumothorax methods.

On Thursday morning, Dr. Donald Frick, of Los Angeles, will present the subject of Angina Pectoris. Dr. Frick has visited our Association be-

fore and his many friends in Arizona will welcome him again. He will, of course, present the subject in his usual masterly manner.

Following Dr. Frick, Dr. Thomas H. Haines will give a summary of his work in Arizona, during the past several months, as the representative of the National Committee on Mental Hygiene. As he nears the completion of this work, so important to the medical profession of Arizona, Dr. Haines desires to leave his report in such shape as will be of the greatest service to the organized medical forces in furthering their legislative work in connection with mental deficiency in Arizona.

Dr. Nelson W. Janney, of Los Angeles, will bring to our attention a subject which no one is better qualified to present—that of endocrine disturbances. Dr. Janney came to California to take charge of the Carnegie Memorial Hospital's metabolic department, in Santa Barbara. After establishing this work on a firm basis, he resigned and entered private practice in Los Angeles. A paper on endocrine dystrophies is always interesting when presented by one who knows the subject, as Dr. Janney does.

In the meeting at Jerome, Thursday afternoon, the Symposium on Urology will be given, including papers by two of the most prominent specialists in this field in Los Angeles—Drs. Rosenkrantz and Roth, both urological surgeons. Dr. Vivian, of Phoenix, will have the diagnostic paper in this symposium.

In the evening, at Jerome, a slight diversion will be offered, and medico-legal problems will be studied in papers by the Association's attorney, Mr. Leroy Anderson, and by Dr. Win Wylie.

On Friday morning, in addition to the Address in Surgery, already mentioned, three prominent visitors will present papers. Dr. Murietta should hardly be classed as a visitor, although he has failed to visit us for so long, that he comes in this class. Formerly chief surgeon of the United

Verde Hospital at Jerome, he will find many friends to greet him on this occasion.

Dr. Howard E. Ruggles, one of the nationally known roentgenologists, author of a text book in his specialty, will bring a subject which will be of keen interest to the surgeons in Arizona. Any subject on industrial surgery always commands attention in Arizona, and the usefulness of roentgenological methods in this connection is of particular interest.

Dr. E. G. Fishbaugh, of Los Angeles, is one of the better known internists of that city, being on the staff of the Good Samaritan Hospital, recently organized on a staff basis. Even the subject of constipation will develop hyperperistalsis under his treatment of it. This is the doctor's first visit to us, but those who are acquainted with him can lend assurance that his paper will present an important subject in an entertaining and interesting manner.

The golf tournament which will occur on Friday afternoon will be worthy of attention. The Hassayampa Club course is famous and well worth playing over. Let every "fiend" leave his dress suit at home and bring the golf bag instead; he will not regret it.

The full and detailed program will be found in this issue of **SOUTHWESTERN MEDICINE**. Visitors from any section of the southwest will be doubly welcome.

PROGRAM

GENERAL INFORMATION

The Headquarters and Registration will be at the Yavapai Club, which is very conveniently located with reference to the place of meeting.

The High School furnishes ideal facilities for the general meetings, having an excellent dark room for lantern slide demonstrations, with ample seating capacity.

Through the courtesy of the Commanding Officer of U. S. Veterans' Hospital No. 50, Whipple Barracks, and his staff, clinics will be held at this hospital on the mornings of June 14th and 15th, preceding the scientific sessions of the program. Opportunity will be given all members of the Association to see the work of this hospital in x-ray, clinical

examinations, and treatment, including artificial pneumothorax and heliotherapy.

JUNE 14th: A picnic-luncheon will be held at noon, at the Hassayampa Country Club, followed by bridge and a golf tournament for the ladies.

In the evening of June 14th, a dinner-dance will be given at the Yavapai Club.

JUNE 15th: A smoker-lunch and business session at the Owl for the open meeting of the House of Delegates, and election of officers.

After lunch, members of the Association and their ladies will be taken by auto to Jerome, 30 miles distant, over one of the finest roads in the state. Through the courtesy of the chief surgeon and management of the United Verde mine, members will be taken to the 500-foot level, where a contest will be held between the teams of the United Verde and the United Verde Extension companies, in mine rescue work. The details of this contest will be arranged by a committee of the Medical Association, who will act as judges and make awards.

The visiting ladies will be entertained by the ladies of Jerome.

JUNE 16th: Luncheon at noon for visiting Rotarians.

At 1:30 p. m., the Medical Association Handicap Golf Tournament will be held at the Hassayampa Country Club, Prescott. The Yavapai County Society will present a trophy to the winner. This tournament will be open to all medical men attending the Association meeting.

An excursion to the Grand Canyon will be arranged for June 16th and following days, if a sufficient number signify a desire to take the trip.

WEDNESDAY MORNING, JUNE 14th.

8-9 a. m.—Registration.

8 a. m.—Meeting of Council.

8:30 a. m.—Meeting of House of Delegates.

9 a. m.—SCIENTIFIC PROGRAM.

1. "*Abscess in the Lung*"—Meade Clyne, Tucson.

Discussion opened by I. D. Loewy and Clarence Moore.

2. "*Thoracoplasty*"—Willard Smith, Phoenix.

Discussion opened by Meade Clyne and L. A. W. Burtch.

3. ADDRESS IN MEDICINE. "*Tuberculoma of the Brain*"—Walter D. Sheldon, Rochester, Minnesota.

4. "*The Early Diagnosis vs. Positive Diagnosis in Tuberculosis*"—W. O. Sweek, Phoenix.

Discussion opened by Spencer D. Whiting and A. D. Wilson.

11:30 a. m.—Take cars through Whipple and immediately out to the Country Club for picnic-luncheon.

WEDNESDAY AFTERNOON, 1:30 p. m.

5. "*Gland Therapy in Tuberculosis*"—F. H. Redewill, Phoenix.

Discussion opened by C. A. Thomas and A. Wallace.

6. "*The Treatment of Pulmonary Tuberculosis with Partial Antigens*"—Max Rothschild, San Francisco.

Discussion opened by S. H. Watson and John W. Flinn.

7. "*Value of Blood Chemistry to the Practitioner*"—P. B. Newcomb, Tucson.

Discussion opened by W. W. Watkins and Geo. E. Goodrich.

8. "*The Fallibility of Clinical Laboratory Methods*"—W. Warner Watkins, Phoenix.

Discussion opened by E. A. Gatterdam and H. L. Goss.

9. "*The Relation of Nasal and Accessory Sinus Disease to Asthma*"—J. J. McLoone, Phoenix.

Discussion opened by W. A. Schwartz and C. R. K. Swetnam.

10. "*Food Addition Method in Asthma*"—O. H. Brown, Phoenix.

Discussion opened by C. E. Rooney and E. W. Phillips.

1:30 to 4:30—Bridge and golf for visiting ladies at the Country Club.

WEDNESDAY EVENING, 7:30 p. m.

Dinner-Dance at Yavapai Club

Address of Welcome—Morris Goldwater, Esq., Mayor of Prescott.

Address of Welcome—H. W. Heap, Esq., President Chamber of Commerce.

Address of Welcome—Gail D. Allee, Commanding Officer, U. S. Veterans' Hospital No. 50.

Address of Welcome—John W. Flinn, for Yavapai County Medical Society.

Response—W. V. Whitmore, Tucson.

Address—Honorable Thomas E. Campbell, Governor of Arizona.

President's Address—A. L. Gustetter, President Arizona State Medical Association.

THURSDAY MORNING, JUNE 15th

8 to 9:15 a. m.—Clinics at U. S. Veterans' Hospital No. 50, Whipple Barracks.

9:30 a. m.—SCIENTIFIC PROGRAM

11. "*Henoch's Purpura, Report of a Case*"—James R. Moore, Clemenceau.

Discussion opened by A. G. Schnabel and James Thom.

12. "*Angina Pectoris—With Review of Cases*"—Donald J. Frick, Los Angeles.

Discussion opened by Gail D. Allee and F. T. Wright.

13. "*Mental Hygiene in Arizona*"—Thos. H. Haines, Phoenix.

Discussion opened by Thos. Cummins and H. P. Mills.

14. "*Infantile Spastic Paralysis*"—R. D. Kennedy, Globe.

Discussion opened by A. M. Tuthill and E. M. Tarr.

15. "*The Diagnosis of Certain Endocrine Dystrophies*"—(Illustrated by lantern slides)—Nelson W. Janney, Los Angeles.

Discussion opened by Geo. A. Bridge and E. Payne Palmer.

12:15—Luncheon at Owl. Open meeting of the House of Delegates.

1:30 p. m.—Leave for Jerome.

3:30 p. m.—Arrive at 500-foot level of mine.

Contest between teams of the United Verde and United Verde Extension companies in mine rescue work.

Visiting ladies will be entertained by the Jerome ladies.

5 p. m.—SCIENTIFIC PROGRAM (AT JEROME)

16. "*Kidney Function*"—Charles S. Vivian, Phoenix.

Discussion opened by P. C. Christian and H. A. Rosenkranz.

17. "*Some Experience in Surgery of the Prostate*"—Herbert Augustus Rosenkranz, Los Angeles.

Discussion opened by C. S. Vivian and Nelson C. Bledsoe.

18. "*Some Observations from the Clinical and Laboratory Findings in Pyelitis and Pyelonephritis*"—Leon Joseph Roth, Los Angeles.

Discussion by C. S. Vivian and V. A. Smelker.

THURSDAY EVENING, 7 p. m.

Dinner-Smoker at Jerome.

SCIENTIFIC PROGRAM

19. "*Development and Maintenance of Breast Milk*"—E. M. Tarr, Phoenix.

Discussion opened by A. T. Kirmse and Albert H. Schermann.

20. "*A Criticism of Medical Expert Testimony*"—Win Wylie, Phoenix.

Discussion opened by Howard Cormick and Willard Smith.

21. "*Medico-Legal Problems in Arizona*"—LeRoy Anderson, Esq., Prescott.

Discussion opened by John E. Bacon and W. A. Holt.

FRIDAY MORNING, JUNE 16th

8:30 a. m.—SCIENTIFIC PROGRAM

22. "*Anesthesia—and the Anesthetist*"—H. R. Carson, Phoenix.

Discussion opened by John W. Flinn and W. V. Witmore.

23. "*Sacral Anesthesia*"—A. J. Murrieta, Los Angeles.

Discussion opened by John D. Brooks and H. R. Carson.

24. "*Osteomyelitis, with Report of a Case*"—J. B. Nelson, Mesa.

Discussion opened by R. D. Kennedy and Win Wylie.

25. ADDRESS IN SURGERY—"History of the Diseases of the Thyroid and Development of Surgical Treatment"—Clarence Moore, Los Angeles.
26. "X-Ray Therapy of the Tonsils and its Limitations"—W. W. Wilkinson, Phoenix.
Discussion opened by C. R. K. Swetman and Howard E. Ruggles.
27. "Roentgenology in Industrial Medicine" (Illustrated by lantern slides)—Howard E. Ruggles, San Francisco.
Discussion opened by W. W. Watkins and W. E. McWhirt.
28. "Roentgen Findings in the Common Bone Lesions"—(Illustrated by lantern slides) James Thom, Jerome.
Discussion opened by W. E. McWhirt and W. W. Watkins.
29. "Delayed Bowel Movement Type of Constipation"—(Illustrated by lantern slides)—E. G. Fishbaugh.
Discussion opened by Willard Smith and Walter D. Sheldon.

FRIDAY AFTERNOON

Arizona State Medical Association Handicap Golf Tournament on the links of the Hassayampa Country Club, Prescott.

Open to all medical men attending the meeting.

THE TEXAS STATE MEDICAL MEETING

Those men in Arizona and New Mexico who failed to attend the Texas State meeting at El Paso missed a rare treat.

As a study in coordinated and concerted effort, by a municipality, in entertaining an organization, it was well worth going many hundred miles to witness. Apparently, the city of El Paso had no other business on hand, during that week, except the entertainment of the hundreds of doctors from Texas and distant points.

The El Paso County Society can look back with pride and satisfaction on their work. Besides the unique accomplishment of housing the entire association in all its departments, to-

gether with the scientific and commercial exhibits, under one roof, the Society entertained the hundreds of visitors and their ladies in a royal and characteristic manner. About six hundred registered for the scientific sessions, which were divided into six sections, conveniently grouped and arranged, so that members and visitors could usually attend more than one section during a day, without missing portions of the program.

On the day preceding the Texas State meeting, three auxiliary organizations held their programs, namely, the Texas Roentgen Society, Texas Pathological Society, and the Texas Society of Railway Surgeons. These were all well attended and presented excellent programs. They united for a banquet in the evening, at which the speakers and guests of honor were Drs. Bloodgood of Baltimore, Case and Pritchards of Battle Creek, and Watkins of Phoenix.

A unique and very appropriate feature of the program was the memorial service on Tuesday evening, at which the names of the doctors who had died during the year were read and volunteer testimonials of appreciation offered by friends who had known them.

On Wednesday afternoon, a barbecue was held in Juarez, at the race track, which was attended by hundreds of the doctors. Later in the same evening, the President's reception was held. The President of the Association was held up by the flood waters which were raging at the time at Fort Worth and other points in central Texas. He did not arrive in time for any portion of the meeting, which was presided over by the Vice-President.

One of the most striking features connected with the meeting was the liberal attention given it by the newspapers—secured through the efforts of the Publicity Committee of the El Paso County Society. Not only were there liberal advance notices of the meeting, but the sessions were well

(Continued on page 154)



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covered by reporters and very complimentary, as well as educational editorials appeared from time to time during the meeting. This was a feature which was very pleasing and reflects great credit on the standing of the El Paso profession in the public eye of that region.

The scientific programs were of the highest possible type, the rule of that Association being that every paper presented must have been read before a constituent county society, and have the approval of that society for its presentation before the State Association. This insures a program which is equal, in excellence, to that which the American Medical Association presents and which is much easier to attend, on account of the fewer sections and more compact arrangement.

BOOK REVIEWS

INFANT FEEDING: By Clifford G. Grulee, M. D., L. L. D., Associate Professor and Acting Head, Department of Pediatrics at Rush Medical College. Fourth Edition, Thoroughly Revised. Octavo of 397 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1922. Cloth, \$4.50 net.

This volume on Infant Feeding should be a valuable asset to the general practitioner and student. The subject matter is presented in very good form, readable and is readily understood. The chapters dealing with infant feeding and the nutritional disturbances of the artificially fed infant are especially well treated under the respective headings of weight disturbance, Dyspepsia, Decomposition and Intoxication. The author has added much from his years of practice to the practical as well as the scientific principles which underlie infant feeding today. He puts forth the prac-

them and make use of them with decided benefit to his younger patients as well as to his own reputation.—V. S. R.

A TEXT-BOOK OF GENERAL BACTERIOLOGY—(By Edwin O. Jordan, Ph. D., Professor of Bacteriology in the University of Chicago and in the Rush Medical College. Octavo of 744 pages, fully illustrated. Philadelphia and London. W. B. Saunders Company, 1921. Cloth, \$5.00 net. W. B. Saunders Company, Philadelphia and London.

Bacteriology is a subject in which changes are taking place so frequently that it is imperative for the up-to-date physician to have a text of comparatively recent revision. The seventh edition of Jordan's text-book of General Bacteriology has just appeared. The first edition was printed in 1908, and has been retical application of these principles in such a way that the practicing physician can grasp revised every two years with several additional reprintings. This indicates the desire of the author to keep his work in the foremost rank, as well as the demand by an appreciative profession.

The work, as revised, contains exact up-to-date and reasonably comprehensive data covering the scope of medical bacteriology in its entirety. Charts and classifications are complete and detailed. The chapters on streptococci, pneumococci and typhus fever have received extensive revisions. Possibly nothing in the work attracts our attention so quickly as the puzzling subjects of influenza and the anaerobes, and the common verdict will be that the author has handled them in a very logical as well as possibly diplomatic way. An especially commendable feature of the book is the frequent reference that bacteriology bears to the industries and technological pursuits from the household and agriculture to sanitary engineering. The text is accompanied by many bibliographical references of value to investigators. It contains information that must form part of the armamentarium of every worker along medical lines.

We bespeak for this edition the same appreciative reception as in the past.—E. B. R.

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STATE MEDICINE FROM A HEALTH OFFICER'S VIEWPOINT*

DR. G. S. LUCKETT, State Director of Public Health, Santa Fe, N. M.

There are two simple words which, used singly, can stir in us emotions of pride and pleasure, but, when united, seem to bear a fearful connotation that chills our hearts. They are, "State Medicine." In parts of continental Europe, the thing is an accomplished fact, while the great Anglo-Saxon nation from which we sprang is even now in the midst of a comprehensive experiment on a national scale. Susceptible, as we Americans are, to the eternal lure of "something for nothing," it is not strange that the idea has taken hold among some elements of our own people and that there is being fostered an organized propaganda to introduce some-

thing of the sort into our government machinery. In fact, the matter has gone so far that we see, almost weekly, some medical society here or there denouncing the movement in vehement terms. Broadly speaking, we are passing through the first stages common to all great social schemes, that of active opposition. That such a method of approach is unintelligent; that it is well designed to hasten the realization of our fears, and that the movement can be turned to our own advantage, are the chief propositions of this paper.

What is this thing we call "State Medicine"? Superficially, we see consultants, specialists, general practi-

*Read at the Fortieth Annual Session of the New Mexico Medical Society, at Gallup, N. M., April 28th and 29th, 1922.

tioners, nurses, midwives, clinics, dispensaries and hospitals supported by the State, with sick benefits, maternity benefits, food allowances, and other material assistance, all combining to give relief to that portion of the community receiving the smallest compensation for its labor. But, stripped of its paraphernalia, what is the real essence of "State Medicine"? Is it not fundamentally the application of the simple proposition that "every benefit of the art and science of medicine should be made available to **all** of the people"? It is simple, when we look at it that way, and a doctrine to which we can all subscribe. What we really fear about it is not the principle, but the mode of application. We all agree that there are some who cannot afford to provide themselves or their families with what is considered adequate medical care, but when it comes to determining just who those people are, there is no agreement whatever. Nor is there much provision made for them, once they are sifted out, save through charity.

Is it any wonder that a social movement of this sort should have arisen? The public has begun to distinguish good medical care from the indifferent sort. It has discovered the advantage of hospital over home treatment. And it recognizes the fact that only the very wealthy and the very poor can secure all of these things under our present system. Meanwhile, the great "middle class," those who have moderate incomes, who maintain their self-respect, who try to pay their bills, who support themselves without asking aught of anyone, this most numerous group in our population must be satisfied with mediocre medical attendance, or mortgage the future to pay the doctor. By way of illustration, take the young man with primary syphilis, who is making \$75.00 a month and attempting to support a dependent relative. Can he afford to pay \$25.00 for a single treatment with arsphenamine, when he must receive perhaps ten to twenty such treatments in the

course of a few months? This is not an extreme case, but one that has actually come to notice recently. Furthermore, should he be cast off, to receive charity from the community, when his funds have been exhausted? Is it surprising that he, and millions of his fellows, should feel that there is something wrong with our system and should attempt to take matters into their own hands? Gentlemen, there is but one conclusion—that the medical profession is standing in its own light and is largely responsible for the rising ferment in the public mind.

Such a proposition calls forth an instant negation. But, let us be honest with ourselves. What have we done to meet this insistent demand for a more complete medical service on the part of the elements we have mentioned? The reply is iterated and reiterated that "no one will ever be allowed to suffer," and we must hasten to acknowledge that altruism which has always marked the medical fraternity. But there is no escaping the fact that it is charity. We do not suit the charge to the patient's means; it is the fee list or nothing. And this "middle class," wage earning fellow does not want charity. He wants to pay what is a reasonable portion of his earnings and maintain his self-respect. Fortunately, the problem has been recognized in some quarters and scattering attempts are being made to solve it. A notable example is the pay clinic, found in some of our larger cities, where a person of moderate means may secure expert attention at specific hours and for fees within the limits of his purse. However, such efforts are at present too desultory to make any real impression and only serve to emphasize the problem. What is needed is a thoroughly organized movement, on a national scale, **within the medical profession itself**, to remedy the need, before the initiative is taken entirely from medical hands. When we contemplate the organized fight against tuberculosis, in its many phases, and the child health campaigns, we see

that they have been sponsored largely by laymen. The health insurance laws of England were brought about by non-medical groups. In all of the efforts at social and physical betterment which we can recall, is it possible to name one that has had its origin in the medical profession and that has been supported entirely by that body? Unfortunately, we shall have difficulty in pointing to an example. The physician is intensely individualistic; he focuses his attention upon the single case and on his small round of activities; he finds it difficult, by reason of his training, to see his case multiplied by thousands; he is not at all socially minded. But this is no reason why we should sit supinely by and see our prerogatives snatched from us.

What is the chief prerogative of the profession? Is it not to act as expert adviser to the world on the causes and cure of disease? True, we are doing this now in our own little group, reserving always the right to select our patients and to leave the rest "for someone else." But, by doing this, we are losing the larger opportunity and are opening the way for inexperienced hands to seize the reins. Perhaps it is easier for one not in active practice, yet who has the future of medicine deeply at heart, to see these developments. In our own field of public health we are somewhat more sensitive to popular feeling and are the recipients of much of the criticism of the profession that does not come to the physician's ears. And this very fact places the sanitarian in a position where he can render valuable aid to his colleagues.

Organized public health work has developed in response to popular demand. It is axiomatic that we can go no further than public opinion permits, and, conversely, we must keep abreast of public sentiment or yield to others who will. By reason of this fact and the very nature of our work, we are compelled to think of the group, of the general good, rather than of the individual. To one so situated, need of more adequate medi-

cal provision for a great portion of our people is obvious and the demand is scarcely to be denied. As a result, it has come about that the health departments have taken upon themselves some of the prerogatives that really belong to the medical profession, but that have been neglected by them. Free clinics, health centers, and the like, are merely attempts to meet a social need that was urgent and that had not been met by the organized profession. Instead of being a constant bone of contention, could not these things become the small beginnings, the nucleus, about which a comprehensive plan for adequate, non-compulsory medical care of the whole population might be built? Could not each local medical society form itself into something in the nature of group practice, handling every therapeutic need of the community, while the health department dealt with its own specialty of prevention? In the present state of the profession this may seem like a rosy dream from the heart of a Chinese poppy, especially since it means less of competition and more of co-operation among physicians. But is it such in truth? Must we not make a beginning? And is it not better to begin with what is already at hand, adding a little here and there as we develop our ideas? It would not be so difficult to take over the work of the free clinics for venereal disease, for eye, ear, nose and throat defects, for the care of infants and young children, and for prenatal care. Upon these could be developed what is known as a pay clinic, with its specialties and expert consultation, its laboratory and x-ray services, all for a moderate fee, which would go into a common fund for the payment of fixed salaries to the attendants. Beyond this is the great field of preventive medicine, where the physician and the health officer meet on common ground. Here we find the well baby clinic, the life extension examination, the administration of prophylactic measures, and the like.

What is proposed does not mean the yielding up of vested rights by

either the physician or the health officer, but, rather, a closer union for their own and the common good. Each has his own part to play; yet each is dependent on the other for the rounding out of a complete program for community health. With their educational activities, the health agencies would act as feeders to the medical agencies, while the latter would, in turn, form the chief sources of information and assistance in those matters of peculiar concern to the

health department. To accomplish such co-operative action will take much time and thought and close agreement. But is it not worth the effort? Who will help us, if we do not first help ourselves? Rather than waiting until others have forced some obnoxious scheme upon us, let us face our problem squarely, let us work out our own solution in our own way, meeting this growing demand with a practical program of health and healing for all the people.

THE PRINCIPLES OF ORGANIZED MEDICINE *

DR. A. L. GUSTETTER, Nogales, Ariz.

At our previous annual sessions, the President has been in the habit of delivering an address to the members of this Association in the morning of the first day's session. Being pressed for time by reason of the numerous scientific papers to be presented at this session, the Program Committee inquired if I could arrange my address so that it could, with propriety, be presented to a semi-public gathering. Being thoroughly convinced that the medical profession in the past has not sufficiently taken the public into its confidence, I am very grateful for this opportunity to discuss some of the problems of mutual interest to the public and our profession.

In approaching the subject of "Organized Medicine," which I have selected for discussion tonight, it might be well, first, to outline the purposes of the Arizona State Medical Association, and, I might add, of every other State Medical Society, which can best be done by reading Article 2 of our Constitution, as follows:

"To extend medical knowledge and advance

medical science; to elevate the standard of medical education, and to secure the enactment and enforcement of just medical laws; to promote friendly intercourse among physicians; to guard and foster the material interests of its members and to protect them against imposition; and to enlighten and direct public opinion in regard to the great problems of state medicine, so that the profession shall become more capable and honorable within itself, and more useful to the public, in the prevention and cure of disease, and in prolonging and adding comfort to life."

With these principles I have just read, you now have in your possession all the secrets of an organization which a few uninformed have chosen to call the "Medical Trust," and I question the existence of another organization or group with higher ideals, and which so completely places the interest and welfare of the public above its own interests.

The purposes of this Association at once demonstrate that the public and the doctors have common interests which compel thorough and sympathetic co-operation upon the part of each. The medical profession cannot fail the people without serious detriment to itself; and, on the other

*President's Address before the Arizona State Medical Association, at the Thirty-First Annual Session, at Prescott, June 14-16, 1922.

hand, the people cannot assist in passing laws hampering the profession in its labors or encourage an increased following of the various new cults and expect to escape the evil results sure to follow.

TO EXTEND MEDICAL KNOWLEDGE AND ADVANCE MEDICAL SCIENCE

This is rightly set forth as the prime motive for an "Organized Medicine," and it must be plain to everyone that the profession throughout the United States is living up to this purpose to the very best of its ability. It means that so much more can be derived from the united action of many as compared with an individual working alone and perhaps endowed with selfish motives. This advancement in medical science not only concerns the sick and afflicted, but the well person whose chief desire is that he may be kept well. I believe that, in the not distant future, doctors will devote more time to maintaining good health than to attempting to cure the sick. This means that it will be the duty of the profession to stimulate and educate the people in public health activities, and to demonstrate to the individual his responsibility for the health of the other, as the only way for a continued enjoyment of a healthy mind and body.

The delegates who are gathered here in convention left their homes and fields of endeavor for the sole purpose of exchanging ideas and knowledge concerning the many ailments to which human kind is subject. It is true that many diseases still baffle the most ardent and careful efforts of the trained scientists in their search for the causes, and many other diseases, the causes of which are known, continue to destroy life for the lack of some specific remedy or surgical interference. But, let me assure you, that the sun never goes down upon a day but what members of this profession are unceasingly searching for these unknown causes, nor is the darkness of the night a barrier to the scientist in his en-

deavor to reduce the number of incurable diseases.

Gradually the practice of medicine is exchanging the old appellation of an "art" for the later designation of our profession as an applied science, and in some few specific conditions, we may now pride ourselves upon practicing an exact science. Much credit for this changed condition is due to research work carried on in large institutional laboratories; to the use of instruments of precision and the x-ray; to contributions made by trained pathologists; and to increased efforts put forth by members following the various specialized branches of the medical profession.

The medical profession is rarely, if ever, mentioned in connection with the great progress being made along the pathways of industrial, commercial, and social life, and yet it was a doctor who made the wonderful Panama Canal possible, connecting the two great oceans. Many important industries would long ago have been compelled to cease operation for lack of securing men willing to engage in the numerous so-called hazardous occupations, had it not been for some physician who rendered the work free from danger to life, thus insuring needed employment and manufactured articles necessary to mankind. Can anyone venture even a guess as to the value in dollars and cents of these achievements of the medical profession? These accomplishments are the direct result of an extended medical knowledge and an advanced medical science. I am here to give testimony to you, that the physicians of this state are working along the same broad lines of medical achievement adopted by the profession throughout our country, and I feel certain that at least a few of our number, who are specializing in certain branches of our profession, will make valuable contributions to the future advancement of the medical profession.

Many now admit that a great mistake has been made by the profession at large, in failing to acquaint the public with the great progress

being made from year to year, through authorized ethical articles published in a state health bulletin or even in the newspapers. Permit me briefly to suggest the importance of publicity in this connection. We take it for granted that everyone knows there is a specific antitoxin treatment for diphtheria; everyone knows that scratches and punctured wounds by contact with certain agencies are dangerous and may produce that almost fatal disease, tetanus, commonly called lockjaw. These are most elementary examples, and yet it is needless to state that everybody is not acquainted with even these simple facts, and many unnecessary deaths are reported yearly through ignorance thereof. The one with diphtheria may be poor and decide the malady is only a sore throat and attempt self-medication; the one who has perhaps been scratched by the rusted corner of his metal auto license plate (as in a case which came to my attention), may realize too late the possibilities of the introduction of the germ of tetanus into the scratch to which he gave no thought; and, therefore, severely indict the medical profession for their seeming neglect to warn them about such important matters, which exact their life as a toll for ignorance not of their choice.

Then the withholding of such simple enlightenment, as we may term it, becomes, to the friends of those whose lives were needlessly sacrificed, an almost unspeakable crime. I mention these two afflictions merely as examples, not placing them foremost as evidence of recent medical progress; yet the conquering of these two diseases, which formerly caused so many deaths, is not a matter of ancient history. Thousands of those who composed our armed forces by land and sea during the last world war are alive and with us today by reason of the prompt administration to them of the tetanus antitoxin after they had been injured. There are thousands of intelligent people in this state today who do not believe in vaccination against smallpox; and there is still a greater num-

ber who are indifferent to the protection offered against contracting typhoid fever through the use of typhoid prophylactic vaccine. I believe that ninety per cent of this antipathy on the part of this class of people is directly chargeable to the indifference of the profession as a whole, through neglect to give these important matters necessary publicity.

It is rather a commendable trait the average American citizen has developed, in wanting to "be shown" the why and wherefore about matters which involve introducing into one's system things foreign thereto. This characteristic should be fostered by the medical profession, by demonstrating what is known today concerning these protective measures without expecting the public to accept these things upon the mere statement of an individual doctor or health officer, "that they are pretty good and everybody is doing it." The health officer of a community should not be left alone to disseminate the advantages of a proven preventive, but rather should be assisted in every way possible by the united county and state societies, in order that his opinion along these lines shall be given as the opinion of the profession as a whole. How much more weight and bearing would these cursory suggestions from the health officer have with the people if the latter knew that he voiced the sentiment of those who have observed the benefits to be derived from the application of these preventive measures?

Judicious publicity concerning the early recognition of cancer should not be delegated entirely to the American Society for the Control of Cancer, but their activities should be supported by the entire profession, if the many sufferers from this disease are to be rescued from untold suffering and an untimely death.

TO ENLIGHTEN AND DIRECT PUBLIC OPINION IN REGARD TO THE GREAT PROBLEMS OF STATE MEDICINE.

Whether due to the natural consequences following the great world conflict or whether the result of a

gradual misunderstanding, the present might be termed strenuous times for the medical profession. We seem to find ourselves in the midst of an environment of every conceivable kind of emotionalism; sentiment running wild and unchecked by reason; a spectacle of the people's representatives, the legislators, seeking to interfere with the pleasant and agreeable relations existing between physicians and their patients. In some states, not once, but many times, has it become necessary for the physicians to enlighten the people, in order that those whom the legislation was presumably to aid, could understand the hidden harmful results which were sure to be theirs, if the legislation in question was not promptly and decisively defeated. I am happy to be able to state that thus far there have not been any bills introduced in our Arizona Legislature designed to disturb the mutual cordial and pleasant relations existing between the people of this great State and the medical profession; and, as our interests are common interests, God forbid the entrances to our legislative halls of a false representative of the interests of the people, who has the temerity to break down these bonds of friendship, admiration and respect which have been ours through these many years and which must continue for the welfare of all people, whose servants we of the medical profession delight in considering ourselves.

You inquire what is meant by "State Medicine?" At the last session of the American Medical Association, held at St. Louis during the month of May of this year, the following Resolution was passed:

"The American Medical Association hereby declares its opposition to all forms of 'state medicine,' because of the ultimate harm that would come thereby to the public weal through such form of medical practice.

"'State medicine' is hereby defined for the purpose of this Resolution to be any form of medical treatment, provided, conducted, controlled or subsidized by the Federal or any State government, or municipality, excepting such service as is provided by the Army, Navy or Public Health Service, and that which is neces-

sary for the control of communicable diseases, the treatment of mental disease, the treatment of the indigent sick, and such other services as may be approved by, and administered under the direction of, or by a local County Medical Society, and are not disapproved by the State Medical Society of which it is a component part."

The Sheppard-Towner bill, recently passed by our National Congress, is an example of "State Medicine." This is intended to improve maternity care, through a lay bureau, known as the Children's Bureau of the Department of Labor. We must not overlook the great wisdom of some of our national law-makers at Washington, who, being so thoroughly versed upon scientific questions, immediately knew that the care and control of maternity or "labor cases" must naturally be dealt with by the "Labor Department." A humoristic trait must be a necessary requisite among at least some of our national law-makers. An amendment to the bill provides an Advisory Board, one member of which shall be a physician, the Surgeon General of the U. S. Public Health Service. This Advisory Board may be called into consultation by the head of the bureau. Improvement of maternity care is a laudable purpose and no one should be against such an effort, least of all a physician who knows the needs thereof. But this legislation was framed (and "framed" is the proper word to use in speaking of this bill) by politicians. The bill intends rendering medical aid, yet those who assisted in making the provisions were perhaps shoemakers, good lawyers, architects, merchants, manufacturers, etc., but they asked neither aid nor counsel of those who could have given them advice founded upon that greatest teacher of all time, experience. The means provided in the bill will not afford any effective remedy for existing state aid for the purpose of financing public health activities, which many attack as financially and economically unsound, as well as an unfair and unjust method of taxation, inasmuch as the states that do not care to avail themselves of this sub-

sidy, must pay for the experiments of those states that seek this unproved benefit.

I feel a full and free discussion of this Sheppard-Towner bill to be very important at this particular time. Undoubtedly the next session of the Arizona Legislature will be requested by some of its constituents to take advantage of the fact that the United States Government has offered each state which adopts the plans promulgated by Miss Lathrop, the head of the Children's Bureau, the sum of \$5000 and the promise of an additional sum pro-rated from the appropriation, which, in the case of the State of Arizona, will amount to \$2254, provided the State of Arizona will appropriate a like amount.

In asking the people of this state to oppose the acceptance of federal aid in connection with the provisions of the Sheppard-Towner bill, sufficient reason should be given by the medical profession for the united opposition of our profession against this particular federal aid offered. The principal operating clause in the Sheppard-Towner Act reads as follows:

"The Children's Bureau of the Department of Labor shall be charged with the administration of this Act, except as herein otherwise provided, and the Chief of the Children's Bureau shall be the Executive Officer. It shall be the duty of the Children's Bureau to make or cause to be made such studies, investigations, and reports as will promote the efficient administration of this Act."

This is the only clause in the Act which even intimates what is intended to be done for the promotion of the welfare and hygiene of maternity and infancy, and for other purposes. All of the other clauses in the Act deal solely with the manner in which the appropriation shall be made. The administration of such an important matter is left in the sole charge of Miss Lathrop, who has surrounded herself with seven other unmarried women, who constitute the Children's Bureau as Executive Officers. The Bill states that they are to make studies, investigations and reports, and by these methods they are going to revolutionize maternal care and

the rearing of children.

Senator James A. Reed of Missouri, a man of sterling qualities, of great courage and intellect, during his speech in the United States Senate upon this subject, stated:

"We are not yet to have compulsory registration of pregnancy through the local health officer but it has been recommended that the speech favoring it be printed by this Bureau. If the scheme is established and made effective, public registration will soon be demanded by the Bureau and required by statute. Mr. President, why should doctors protest against this bill? I think I can answer. This interference by the government will probably cause the death of many infants and destroy the health of many women. Doctors know there is nothing which fills their offices so quickly or the graves of cemeteries so generously as the effort of people to doctor themselves according to the teachings of books which they cannot understand.

"If this bill were drawn along the right lines, it would seek to induce women who were about to bear children to consult the best physician of their neighborhood, consult him at an early date, and follow his advice. If there are any too poor to pay the doctor, then a stipend might well be paid by the State. In that way, the very poor could have the aid of a man capable of rendering real service.

"That, sir, is not the line on which this bill proceeds. It undertakes to teach the women, through books, how to rear their children. It seeks to dictate, through traveling nurses, how they should rear their children. Every tendency of the bill is to keep women from consulting the family physician and to rely upon the literature, lectures, and teachings of this bureau.

"The scheme is one of the most pernicious ever devised. I repeat, there are a hundred and fifty thousand physicians in the United States armed with the best knowledge the medical profession has gathered during the long ages. The doctor is there for that business. He is part of the life of the community. He knows the people and they know him. He is the proper advisor in every case where health is concerned.

"The tendency of this bill is to substitute for the family doctor, learned in the profession and devoted to his people, the traveling nurses, the circus wagon lecturer, the socialistic and bolshevistic theorist, and to induce the people to trust in their guidance and care. Such, indeed, is the purpose of this bill.

"I think the Senate is going to pass it, because many Senators are pledged. The man who pledges his vote in advance gives away his legislative birthright, forfeits the opportunity to gain by debate, and to learn in the consideration of a bill its defects or its merits."

This last sentence of Senator Reed's is an honest statement by a careful

and considerate Senator, and, if the United States Senate were composed of more men of this caliber, there would be no reason to fear the encroachments of "state medicine" or the future adoption of paternalistic ideas within the United States.

Miss Helen Todd, former chief campaign speaker for the New York Suffrage Association, and, later, Chairman of New York's greatest "Birth Control" meeting, had this to say: "Place the mothers on the Government payroll and pay the money which would otherwise be spent in preparing for war—every mother, rich or poor, should receive Government endowment." The bill in question does not mention endowment of motherhood, but if, in the opinion of the Executive Officer of the Children's Bureau, such a step should be deemed advisable, there is no one to hinder such an advance towards socialism.

At a conference of the Children's Bureau, called in June, 1919, minimum requirements were mentioned. Among them, the compulsory registration of pregnant women was openly advocated without opposition or rebuke.

President Harding, in his recent address at Plymouth, stated as follows: "The one outstanding danger of today is the tendency to turn to Washington for the things which are the tasks or duties of the forty-eight commonwealths which constitute the nation. Having wrought the nation as the central power of preservation and defense, let us preserve it so." This statement of our illustrious President applies with particular force to the operations and purposes of the Sheppard-Towner Act.

The health of the expectant mother and the care of the infant and child should properly be looked after by the subdivisions of each state; there the contact between the physician and the patient is closer; the surroundings and environments of the people can be studied to greater advantage and the particular remedy applied with more promptness and with an equal, if not better, applica-

tion of scientific methods. There should be no desire on the part of the state and county governments to shirk the responsibility of caring for both mother and child, where such care is necessary.

The methods at present in vogue are, that those who are able to pay seek their own medical advice with neither suggestion nor hindrance from anyone. Those who are not financially able to pay for such services, are provided for by the County Supervisors, who employ in each county a reputable physician whose duty it is to render any necessary treatment or advice, and this certainly includes maternity cases, which this act contemplates taking out of the hands of each local government. For personal care, they will substitute mail-course treatment, designed to carry them through in a much more successful way than could be done by a physician in actual attendance upon a case.

Other examples of "State Medicine" are compulsory health insurance; likewise free health centres where persons able to pay for services are treated free of charge and are at once pauperized. All of these forms of state medicine are paid for by the government, which derives its money from the taxes paid by the people, so that anyone willing to sacrifice pride or principle can be treated at the expense of the taxpayers while possessing means of their own to pay for such services.

All of these new ideas advanced are based upon the principle that the Government, acting as a paternal agent for the people from the cradle to the grave, irrespective of their financial position in life, can and will do more for the individual collectively than the individual can do for himself. Uncle Sam or his political agent will select your doctor, your nurse, your hospital, and, perhaps in many cases, your undertaker. You will have no concern in the selection of any of these elements mentioned to cure you, for the reason that thinking upon your part might militate against your ultimate recovery.

The Federal Government fortunately only too recently attempted to demonstrate to the people how much better and more economically a government can run a railroad than trained railroad officials. The experiment involved material things, and yet proved an utter failure; therefore, I ask, are we again to be treated to such another experiment involving the lives and comfort of our people? God grant that the people may have the wisdom to refuse to be treated by government machinery rather than by the family physicians of their choice.

TO SECURE THE ENACTMENT AND ENFORCEMENT OF JUST MEDICAL LAWS.

This is another sworn purpose of our organization. Notice the wording, "just medical laws," which makes it plain that any such laws advocated or secured must be in the interests of the people as well as of the profession. The statement of this particular purpose leads me to the discussion of a somewhat delicate subject made so for the reason that I may be misunderstood by those who will not admit that there is a decided difference between a purely medical question and a social or police regulation. Before proceeding further in my remarks, permit me to make it plain to those who hold to their faith and advocacy of Prohibition, that the medical profession of Arizona has no quarrel with them for the views they may hold concerning the use of intoxicants for beverage purposes, but it does resent dictation from persons not possessing scientific knowledge of the question involved as to what may or may not be prescribed as medicines. We are not measuring up to our full duty to the people, our patients, if we conscientiously hold the opinion that whiskey, wine or beer are useful or beneficial in the treatment of disease, and do not lend our voice and influence to retain our right to prescribe these agents, and the rights of the sick to obtain such remedies when indicated. In making mention of wine and whiskey, I am naming them as drugs the same as I

might mention hundreds of other drugs described in the United States Pharmacopea, where whiskey and wines are described and which were available to physicians along with these other drugs, until rudely eliminated by overzealous persons devoid of consideration for medical opinion on the one hand, and lacking proper sympathy for the sick and suffering on the other hand. I do not intimate by this that everyone who voted for prohibition was devoid of these principles, for that would be an unfair and unjust accusation, but I do believe that many voted for prohibition who never had the slightest idea that prohibition was to invade the sacred and legal rights of the physicians to prescribe whiskey and wine as drugs, if in their judgment they were necessary.

During the month of December, 1921, a referendum on the therapeutic use of alcohol was sent to every alternate physician on the mailing list of the Journal of the American Medical Association. According to the statistics compiled by that Journal, 173 of such questionnaires were mailed to physicians residing in Arizona, and 110 replies were received, with the following results: Fifty-one per cent (51%) regarded whiskey as a **necessary** therapeutic agent, thirty-four per cent (34%) so regarded wine, and twenty-six per cent (26%) consider beer a necessary therapeutic agent. Fifty-one per cent of the doctors who answered the questionnaire considered whiskey a necessary therapeutic agent—mind you, they did not state that it might occasionally be a useful remedy, but that it is a necessary remedy. In my opinion, the use of the words "necessary therapeutic agent" by the Journal of the A. M. A. was rather unfortunate and misleading, for the reason that, if physicians were limited to prescribing only "necessary remedies," drug stores would present a vacant appearance and the question would then arise as to just who should constitute the judge and jury. With the single exception of alcoholics, physicians of Arizona are per-

mitted to prescribe medicines in accordance with the dictates of their own experience. The majority of the medical profession of Arizona who gave expression to their honest belief that whiskey was a necessary therapeutic agent, did so without concern for the broad question as to whether alcoholic beverages, when taken as such by healthy persons, are harmful or not; therefore, I consider the question as of medical importance only, and in this regard should not be treated as a social regulation nor as a reform measure. Let me reiterate that the medical profession is in no way concerned with the prohibition question and that it does not desire to be used by either the "wets" or the "dry", as being for or against prohibition, and I trust I can make this point clear to everyone in order that there may not be any misunderstanding as to just what the desires of the medical profession are in this respect. Many of the doctors, in their answers to the questionnaires, related cases wherein they honestly believed that numerous lives were saved through the use of whiskey in certain diseases. Some people mention the fact that many persons are killed through the abuse of liquor, and the statement can as truly be made concerning electricity, railroad trains, street cars, automobiles and other numerous agencies, but we don't abolish these things—we regulate them to the best of our ability.

It is a sad comment on the judgment of prohibition advocates in this state, that temperance cannot be promoted without depriving the seriously sick person of his or her chance to live, and recalls to my mind how some years ago we used to see the ambulance recklessly tearing down crowded thoroughfares, answering a "call of mercy," sometimes killing innocent pedestrians in their anxiety to respond to the call perhaps of a drunk or a slightly injured person. Physicians are permitted to prescribe narcotics under certain restrictions, and surely can be trusted with just a little more responsibility in prescribing alcoholics under somewhat similar

restrictions, making sure that it is absolutely in the interest of the sick. I don't believe any of the physicians of Arizona would willfully violate any of the provisions granting the physicians the right to prescribe alcoholics in bona fide cases of sickness. However, in my belief, should a physician be convicted of a second offense of prescribing alcoholics unlawfully, his license to practice should be revoked. This would be a proper safeguard against alcoholics falling into the hands of those not legally entitled to same. Personally, I should rather see a man under the influence of liquor ten times than see his mentality deadened by the use of a narcotic drug just once.

Arizona and six other states are the only ones in the Union where alcoholics are absolutely prohibited in any form as therapeutic agents. In my opinion, our Association should seriously consider this question at this session, for several reasons. First, that we may measure up to our full responsibility to the best interests of the sick, who cannot obtain this remedy when needed, except through our aid. Secondly, that the doctors of Arizona should awaken to the fact that, if we permit our rights to prescribe in accordance with the dictates of our experience to be legislated against without protest in this instance, it surely is only a question of time when other equally and perhaps more serious infringements upon our rights will be attempted and carried through. As a third reason, the politicians should be made to realize that, in the future, the doctors must be considered as an important element in our body politic, when questions concerning the cure of disease or prevention thereof are involved, and that the medical profession will not countenance further unjust legislation directed against either the interests of the people or our profession. As a final reason, I believe that dignified action upon the part of this Association will not only put the alcoholic drugs back upon the druggist's shelf where they belong, but will put there a pure and unadulterated whiskey

and wine to which the patient is entitled, instead of the poisonous fire-water now offered for sale. An appeal should be forwarded to our representatives at Washington, that the Government supervise the manufacture and sale of whiskey for medicinal purposes and regulate the price thereof.

Addressing myself to the members of this association, permit me to state that this should be the occasion for the President of the organization to give a brief outline of the work performed during his almost six months' incumbency. I regret to state that, aside from signing a few vouchers and sending fraternal greetings in the name of this association to the Texas and California medical conventions, I have done nothing in furtherance of the interests of this organization, and in this I believe I have followed the footsteps of my predecessors and responded willingly, as they have done, to the requirements as set forth in our Constitution and By-laws, which almost completely place a limitation upon any activity of the chief executive of this association. In my opinion, the Arizona Medical Association is splendidly organized for the prosecution of our scientific needs, as evidenced by the numerous valuable papers presented for our consideration at this session, but I do not hesitate to say that we are not so well organized when it comes to matters bearing upon our relationship with our fellow men.

I do not mean to infer that we lack co-operation, cordiality or that sterling quality of friendship which exists among doctors; we have all of these qualities in the same measure and degree that exists in any other state medical society. We have a comparatively large numerical strength, but our present power of influence with the people is not in keeping therewith. *As an organization*, we have neglected to cultivate and establish public confidence and co-operation. *As an organization*, we have many times allowed misconception of our motives to go uncorrected. The medical profession is often represented by

the press to be for this measure and against something else, with no one authorized to circulate a referendum amongst our members to determine what the majority of the profession is for or against, in order that an intelligent and representative correction could be made. How can we expect the confidence and co-operation of the people when they don't know where the medical profession stands upon these various new problems being presented to society in quick succession? In our anxiety to solve the many problems confronting us in a scientific way, we must not permit the progress that is being made by society in general to pass in review unnoticed.

We hold an election of officers each year, which means an almost complete annual change of officials. For this reason, I take it, my predecessors must have felt the same timidity about recommending any innovations in the future conduct of our association affairs, as I have felt since my induction into office. However, at this time, other organizations and big concerns are reorganizing and bringing their methods of operation up to the standard required through growth and changed conditions, and, with this thought in mind, and after a careful study of the present methods in use in the conduct of the affairs of this Association, I am prompted to make several suggestions for your earnest thought and consideration.

First of all, I believe the rank and file of our membership, which is the foundation and backbone of this organization, should be in closer contact with the men they elect to the various offices. This I find difficult on account of the fact that, during the interval between annual sessions, no committee nor any other official has authority to circulate a referendum, no matter how important or necessary to the welfare of this organization or the public such a step might be. It is true, the three doctors elected to serve as Councilors function individually in their respective districts, but they have no general nor specific authority

to speak or act for the profession of this state. The three members appointed to serve upon the Committee on Public Policy and Legislation are only empowered to represent the association under direction of the House of Delegates. The House of Delegates meets in April, May or June and our State Legislature meets in January, thus making it impossible for the House of Delegates to venture a guess as to what legislation is contemplated in order properly to instruct the Committee on Public Policy and Legislation.

It is my belief that provision should be made whereby the President, with the majority approval of the Secretary and the three members of the Committee on Public Policy and Legislation, or upon a written request signed by twenty-five members, should be authorized to circulate, for referendum vote, any matter of importance to the profession wherein a prompt expression of opinion is deemed advisable. The organization would then be active during the period between annual sessions, instead of inactive, as at present, and each member would have equal opportunity to register his opinion and there would then be no chance for a misunderstanding by anyone as to what the profession advocated or opposed. This slight change in our By-laws would not only serve to maintain the interest of the members in association affairs during the intervals between annual meetings, but would also keep the profession in closer touch with the public at large.

I want to make mention of the necessity for increased funds. We have 195 members in our Association, each paying annual dues of \$10.00, apportioned as follows: Defense Fund, \$7.00; Journal, \$2.00; for General Expenses of Association, \$1.00. This organization has the munificent sum of \$195.00 with which to carry on a work of so great importance as that intrusted to the medical profession. This fund is inadequate during these times of inflated prices, to accomplish the many things designed by our By-laws to be carried on. A

clause in our By-laws reads as follows: "Shall endeavor to shape legislation so as to secure the best results for the whole people, and shall strive to organize professional influence so as to promote the general good of the community in local, state and national affairs, and elections." These are commendable efforts, but \$195.00 would not carry your voice nor sentiment very far from headquarters.

Other organizations of professional and semi-professional nature have already learned the necessity of increased membership dues to properly carry on their work. Labor organizations, with thousands of members who receive less average remuneration for their work, require much larger sums to be paid as dues, in order that they may derive proper benefits therefrom. I believe, in order to get more out of our State Association, we should put more into it, and therefore, in the interest of the future welfare of this Association, I suggest the matter of increasing the amount of annual dues for your consideration.

I have been told, and I know many of you have often heard it repeated, that there are some physicians in this state who accept from druggists a percentage upon the amount paid by patients for prescriptions; that others receive a commission from undertakers for their recommendations; and that fee-splitting is indulged in by a few. It is needless to say, such practices are considered reprehensible and are condemned by this organization. I believe the public is entitled to know that the members of this organization are unanimously against any such questionable methods of obtaining money; and, by the adoption of a suitable resolution, should make this fact known in no uncertain way.

PAY MEDICAL CLINICS OR GROUP PRACTICE

Inasmuch as pay clinics and group practices are rapidly being established everywhere, I cannot refrain from making brief comment concerning these new methods of administering

ing to the needs of the sick. There have been very few new diseases added to the list in recent years, but many new specialties are being created yearly. When we stop to consider the many new methods of diagnosis and treatment in vogue today, we naturally must wonder how people in years gone by ever attained their majority and we might be prompted to sympathize with what some may consider our less fortunate predecessors, the "doctors of the old school," were it not for the fact that many of our old people with us today are still enjoying life as a testimony to the skill and efficient care of that very same personage, the "doctor of the old school"

In these days of progress, when one has only to press a button to obtain light by electricity, no one wants to go back to the days of either the candle or coal-oil lamp; but it does behoove the wise man to keep these relics of olden times around, because sometimes electricity fails us. Time alone can answer the question as to whether group practice is a passing fad, or whether, with modifications which experience will dictate, this method of professional combination is to be a permanent and recognized factor in our profession. Much may be said in its favor if it can be kept free from creating the impression of commercialism and if the human element in the treatment of the sick predominates over methodical and mechanical methods. If group practice continues its present growth, the general reputation and standing of the entire medical profession will soon be in the hands of those so engaged. The profession is destined to rise or fall in the estimation of the public by the impressions created in the minds of the people concerning the treatment and results obtained through the agency of these combinations. The temptation to form such groups in many places within this state will perhaps not soon present itself, on account of the small population in most of our cities.

I am not among those who believe

group practice will ultimately eliminate the old stand-by, the family physician, who by his kind, patient and sympathetic interest has won the love and respect of each member of the household visited by him. Neither do I hold the opinion that these new methods, adopted by many practitioners, presage a division of our profession. So long as one preserves within himself the traditional morals, honesty and ethics which have always been the distinguishing marks between a reputable physician and a charlatan, I can see no reason why every doctor should not reserve the right to practice alone or in company with others, in accordance with his own choice in the matter. I can see no reason for pique or antagonism on the part of either class, but we should all appreciate the fact that there must be helpful co-operation from one to the other, if a gap in our profession is not to be created.

The general public are the ones who will eventually be the determining factor in the success or failure of these new methods, depending entirely upon the character of service, the end results, and their ability to pay for these combined efforts. In the meantime, it behooves those who prefer to continue in the practice of medicine alone, to await the outcome of the present experiment being carried on by those engaged in combination practice, each respecting the rights of the other, with the thought always uppermost in the minds of both, that the welfare of all the people, after all, is the common purpose and aspiration of our profession, regardless of the method of practice we may choose to adopt individually.

Addressing myself now to all present, let me state that the three men who composed the committee on organization of the American Medical Association, which drafted the Constitution and By-laws adopted by this State Association, parts of which I have read to you, must have realized at that time (now quite a few years past) the great importance of proper publicity and a paramount mindfulness by the profession of the vital

interests of the public. I feel safe in making the statement that, at this very moment, ninety per cent of the residents of this state have not the slightest idea of the purposes and aims of this Association; and the same people do not know that a convention is held annually, solely in the interest of disseminating knowledge which may benefit mankind. They have read and talked about the "medical trust" and, as corrections have not been forthcoming, some really and truly believe there is such a combination among doctors, designed to take advantage of the public at every possible opportunity and unwilling to give anything to society without some financial return. I am, therefore, very grateful to the Program Committee for affording me this privilege of reading you extracts of our Constitution thus giving to you, at first hand, the innermost secrets as to why organized medicine exists and who the real benefactors of this organization are. I trust it may be made plain to everyone that "organized medicine" means we are organized against disease only; not in any manner against society, but in the interests of society.

I believe and will admit, both layman and doctor, that nothing at this time could be added to, or subtracted from the principles as enunciated in Article 2 of our Constitution, which would in any way improve present conditions, or better safeguard the interests either of the public or the profession. I am proud to subscribe to the sentiments contained in that article and feel it should receive more study and publicity and certainly justifies the medical profession of Arizona building upon such a solid and broad foundation.

Let us not forget that it was due to organization team work that the medical profession of the United States was enabled to make its contribution of over 35,000 civilian doctors, who assisted those of our armed forces in winning the last great war. Besides this number, approximately 25,000 more rendered free service to the government on selective service boards or in other like capacity.

I hope the medical profession of Arizona will always be true, to an exactness, to each and every principle set forth in our Constitution and By-laws; that it will always be first in an honest endeavor to enlighten and direct public opinion, not only in regard to State Medicine, but in every matter which pertains to the prevention or cure of disease. Then, and then only, will we merit and receive the public confidence and sympathetic co-operation which at all times we must possess, in order that our profession in the future may maintain the high ideals and traditions of the past.

In conclusion, I want to admonish every member of this Association to keep before him, as his guiding star, the lofty purposes of this organization. If they are followed by you in letter and spirit, your reward will be the satisfaction of knowing you have made your contribution to mankind through faithful and efficient service; that you held the light along life's pathway for infancy, youth and old age, insofar as God in his wisdom entrusted you with the knowledge to prevent or cure disease; and that you assisted in making life more comfortable and enduring for the many who placed their faith in your ability.

OPERATION OF ELECTION IN CHOLECYSTITIS*

DR. CRUM EPLER, Pueblo, Colorado.

In a consideration of choice between removal or drainage of the gall bladder, there are many factors to be taken into account. Which surgical procedure—cholecystostomy or cholecystectomy—is to be adopted, has been discussed at length. No doubt, there are indications for each.

It is believed that experienced surgeons are increasingly and more frequently doing cholecystectomies. They are now able to bring forward sufficient end-results, covering a period of years, to form a more stable analysis of what may happen following a particular procedure.

To discuss thoroughly the indications for the various operations a rather careful study should be entered into as to anatomy of the gall bladder, ducts and pancreas; features of histology, etiology and pathology of the normal, as well as certain anomalous conditions very frequently found, but time will not permit of covering so great a field. A discussion of the etiology, however, will be covered with dispatch. It is rather conclusively accepted now that all gall bladder disease is secondary, and due to infection, except in rare cases where mechanical interference, cholesterin stones, new growth, or trauma, play a part, and, even in these latter cases, infection, after all, is the causative factor. Infections occur either by the **descending** route, through the hepatic artery, or portal vein, or the **ascending** route, up the common and cystic ducts. Under descending infections, those **hemic** are divided into septicemic and focal. The former are all pneumococcic, influenzal or puerperal, while the latter are from foci, such as teeth, tonsils, sinuses etc. There are also the alimentary disease infections, such as enteric fevers, appendicitis, cecal and colonic stasis due to partial obstruc-

tion and low grade peristalsis incident to peritoneal bands, producing the etiologic source of hemic infection. Typhoid fever is now believed to be the cause of 8 per cent of cholecystitis.

It was believed at one time, not so far distant, that all infections came to the gall bladder through the ascending route, and possibly, too, by a backing up, as it were, from an infected duodenum. But Coffey has shown by experimental work on animals that a strong valve exists at the duodenal end of the common duct, that will resist back pressure until the duodenum will rupture before it will let a reflux through; this would appear to be evidence against such a source of infection, but, as it is not necessary for micro-organisms to be under pressure to secure entrance, it is conceivable how such bacteria could enter through the valve of Oddi and find their way into the gall bladder.

The only occasional finding of bacteria in the bile of a chronic cholecystitis caused the investigators to believe that the source of infection may be by other routes as suggested above. Rosenow, in his experimentations, has shown selective action of bacteria upon different tissues. He was able to demonstrate a regular blood stream infection in his animal experimentation, that would produce as high as 80 per cent of infection of the same organ by using the same strain of bacteria. This would lead us to believe that certain bacteria will attack the gall bladder as the organ of election. Granting this hypothesis, there is no alternative save cholecystitis, whenever the proper strains course the blood stream. After drainage of gall bladders whose contents contain no pathogenic bacteria, they seem to recover very slowly, and,

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in fact, are subject to relapses. The careful investigation of their sub-mucous tissues will frequently culture growths. This would lead us to believe that the micro organisms do not always exist in the free contents of the viscus, but really in the connective and musculofibrous tissue. Granting this, and certainly it seems from the above to be true, then drainage will not permanently cure the disease.

Chas. Mayo has said that many apparently healthy gall bladders have been taken out when the deciding factor in the case was the careful examination of the glands along the common and hepatic ducts, in the hands of the skillful surgeon who is thoroughly familiar with normal glands; upon examining these gall bladders, epithelial degeneration frequently is found to be the cause of the trouble.

With these few hints as to the etiology of cholecystitis, we will now pass to its pathology, and under five headings, with sub-heads, we will mention some of the gross and microscopic appearances, because on these findings, the surgeon has to base the type of operative procedure.

First—Catarrhal: under this we have three sub-heads:

Acute catarrhal.

Sub acute catarrhal.

Chronic catarrhal.

Second—Acute non-suppurative.

Third — Membranous cholecystitis (rare).

Fourth—Suppurative; under this head we have three subheads:

Acute suppurative.

Phlegmonous.

Chronic empyema.

Fifth—Chronic; under this head we have four subheads:

Chronic catarrhal.

Obliterative or sclerosing atrophic.

Chronic ulcerative.

Hydroprocystides fellae.

These are the classifications laid down by the authorities in pathology,

and, while they may not appear to be as important to the operative surgeon as to the pathologist, still a close observance of the microscopic appearance of each will the better indicate the type of operation in the given case.

Catarrhal Cholecystitis:

A. Acute catarrhal: Appearance normal to the naked eye. Microscopically leukocytic and lymphatic infiltration of the mucous membrane; condition may be associated with a pure cholesterol stone due to mild infection and imperfect drainage.

B. Sub-acute catarrhal: Velvety appearance of mucosa; bile more viscid, syrupy, presence of interstitial changes in mucosa and bladder wall; only determinable by opening the gall bladder.

C. Chronic catarrhal: Externally, bladder looks normal; palpable lymphatic gland near duct which is enlarged; mucous membrane shows numerous yellow specks, the resemblance to strawberry seeds indicates the name "Strawberry gall bladder," gall stones may, or may not, be present; this form is common, being about 20 per cent; important further in that it precedes, as well as favors, acute cholecystitis attacks.

Acute Non-Suppurative: Serous coat dull; fibrin plaques coating and may be adherent to adjacent viscera; mucous membrane swollen, congested and often eroded, showing deposits of bile on the surface; specifically pneumococcic and may give rise to hemorrhagic mucosa.

Membranous Cholecystitis: Mucous casts extruded from the wall of the gall bladder, oftentimes pass with colicky attacks and may be recovered in intestinal evacuation—very rare type.

Suppurative Cholecystitis:

A. Acute Suppurative: Associated with gall stones; tremendous infiltration of gall bladder wall; presence of pus; necrosis of mucosa in areas.

B. Phlegmonous: Mucous membrane separated; underlying coats gangrenous; areas of mucosa oftentimes go to necrosis. Likely to occur when calculus is impacted in duct. Factors are virulence of infection, blocking of cystic duct and increased tension. Arterial blocking and thrombotic interference with circulation; areas of gangrene varying in extent, usually begin at fundus and extend in patches to the neck.

C. Chronic Empyema: Large thin walled, pale gall bladder, with bile and pus present; virtually a bag of pus.

Chronic Cholecystitis:

A. Further state may follow acute cholecystitis, acute suppurative, phlegmonous or gangrenous, often adherent to adjacent parts,

surface roughened and thickened; cicatricial tissue replacing mucous membrane in the main; adjacent lymphatics chronically inflamed and indurated, and lymphatic involvement of the head of the pancreas.

B. Obliterative or Atrophic: Thickened wall contracted gall bladder; may show one or more calcifications; walls hardened; fibrosed.

C. Chronic Ulcerative: May give rise to hemorrhage; hour glass contracted; local abscess.

D. Hydro-pro-cystides Fellae: Gall bladder pale, translucent; greatly distended; walls sometimes thickened; fluid wholly free from bile, milky and filled with cholesterol crystals.

These many subdivisions cannot be diagnosed before the abdomen is opened; in fact, should not be attempted. It is now believed by some that cholecystitis is equally as common as appendicitis; that each and every case is surgical and should be promptly operated. Icterus is not a necessary symptom of cholecystitis.

The diagnosis of cholecystitis will not be dwelt upon further than to say that it is not always easy to differentiate it from pathology about the first portion of the duodenum, reflex gastric involvement, chronic subserous or adherent appendix, right renal stone and diaphragmatic pleurisy.

Cholecystitis is an inflammatory reaction of the tissues of the gall bladder and ducts the result of bacterial infection. A carefully taken clinical history, including history of past or present focal infections, typhoid fever, rheumatism, malaria, chronic seminal vesiculitis, tonsillitis, influenza, pneumonia, especially where there has been an effusion in the pleura, are most important. All these in connection with subjective and objective symptoms, x-ray and clinical laboratory findings, and, in doubtful cases, cholecystoscopy, are essential to a diagnosis, ever bearing in mind to eliminate carefully gastric crisis in spinal cord lesions. Roentgen authorities are claiming that 85 per cent of all cases of cholecystitis, with or without stones, can be visualized on the film. If this be true, it certainly is a very valuable method, in that only 15 per cent of the diseased cases escape the ever searching ray and are left undiagnosed by a single

method, and a method, too, that is so easily accessible. Personally, I cannot subscribe to such a high percentage. Having made a diagnosis warranting a surgical procedure upon the gall bladder, the next thing is to determine how best to attack the pathology. The surgeon will not concede value in medical treatment in cholecystitis farther than what is necessary to prepare the patient for operation, and the limit of this certainly covers only a few days.

Without mentioning well-known preliminary preparatory technic, let us pass to a consideration of the incision necessary to bring most easily into view the subhepatic areas of the abdomen. The old straight, right rectus incision has no place in present day surgery upon the gall bladder and ducts unless it is simply for the purpose of cholecystostomy, because the ducts cannot be satisfactorily examined. This statement likewise applies to the short oblique incision along the costal angle. A very good incision for gall bladder work alone is the transverse incision as described by Forrest Martin of Boston. Exception is taken to this initial incision for the reason that it so frequently becomes necessary to include work in the lower right abdomen, which this incision will not permit, and it is a little embarrassing to make incisions at right angles. This leaves us the incision of Deaver, as the one applicable to most cases, regardless of shape of patient and corpulency. The free sweep, beginning just below and to the right of the xiphoid appendix, curving downward and outward, cutting the rectus muscle, and dropping more nearly straight down as the incision is carried on. This incision should be from 5 to 9 inches long, depending upon the needs and demands for free access to the gall bladder and ducts. The serpentine incision is very similar to the one described above, but has no advantages over the former and will suffice in thin bellied patients. Whatever incision is used, make no mistake by having it too small, because free ac-

cess to the gall bladder and ducts is of prime importance to a thorough examination of and a speedy operation upon the parts. After the abdomen is opened, the use of the kidney pad can be put to great advantage in most cases, and the manual partial rotation of the liver supported by a moist pack on the hepatic retractor brings the gall bladder and ducts into view and easy access in nearly all cases. Time can be saved in getting a proper setting for the internal field of operation before the procedure is begun, otherwise a proper examination of the ducts is absolutely out of the question. After visualizing the gall bladder and the hepatic flexure of the colon, the former is well packed off, and the next step is to determine the type and extent of pathology. In this, naught but a keen perception, experience and judgment will serve the patient's best interest. Crile and others say that all gall bladders should be removed if there has been at any time an acute cholecystitis; if there is a stone in the gall bladder or the cystic duct; if the duct is hard and thickened; or if the wall of the gall bladder is thickened. This statement deals with chronic types of the disease, and, if it is true with the chronic conditions, it is true of the acute, because the acute will become chronic, and certainly the drainage of an acute gall bladder will not make it normal, but will leave it in a stage of chronicity, with an abnormal attachment to give trouble as a postoperative sequel.

Cholecystostomy is only indicated where the enfeebled condition of the patient will not warrant further investigation, and in cases associated with pancreatitis; and this should be considered the first of a two-stage operation for cholecystectomy.

Cysto-duodeno-enterostomy is a warranted procedure in all cases where there is an obstruction, except stone in the common duct. This operation should be accomplished, in cases where lymphadenitis along the common duct is sufficient to occlude the duct by pressure; where carcinomatous involvement has destroyed the

common duct, and in all other cases where the surgeon may deem a drainage operation advisable, the enfeebled condition of the patient permitting.

There are several reasons why the old operation of cholecystostomy is illy advised:

1. Anatomical: The size and position of the gall bladder with respect to the free margin of the liver; its almost universal attachment to the liver for about three-fourths of its length; its highly reflex nerve supply, should be considered before its fundus is attached to the fascia of the abdominal wall, especially in view of the fact that the liver is not a fixed organ with respect to the parietes; the reflex irritation, occasioned by respiration, can easily be imagined; the changes of a gall bladder so attached can be fully appreciated by those of us who have had occasion to remove this pathologic tube months after cholecystostomy, the patient complaining of similar distress in the upper right quadrant of the abdomen as before operation.

2. Pathological: A gall bladder must be pathological, otherwise it will not be drained, even by surgeons who still favor the method. Drainage will not cure the pathology sufficient to return the viscus to its normal function; what will happen is, that it will become more thickened and chronically indurated, and will cause reflex gastric distress and flatulence similar to the symptoms of the pre-operative period; also, it will become useless in the terms of its ordinary function.

3. Stones or a thick viscid bile are likely to reform in it and become an irritation, which is not a desirable condition in patients of gall bladder age on account of the possibility of malignancy.

4. The possibility of long tenure of drainage and permanent fistula which will be productive of symptoms, such as gastric distress, flatulence and intestinal disturbance, incident to the lack of bile in the gut. Adhesions which always associate

themselves about the drained gall bladder and in that region will add their mite to the discomfort of the patient.

Reasons in favor of external drainage are:

1. The lowered vitality of the patient, this being the first of a two-step operation leading to cholecystectomy.

2. Ease of surgical procedure, and the relief of hematogenous jaundice, due to the possible overlooking of an occluded common duct at the time of operation.

Reasons against cholecystectomy often brought forward are:

1. The removal of an organ, leaving nothing in its place to function. Strangely no surgical authority makes claim for leaving a diseased gall bladder. Patients are better off without it than they are with it diseased.

2. Shock associated with its removal. This must be approached with some surgical judgment, dependent wholly upon the pathology found, the physical condition of the patient and what the competent anesthetist says the manipulation in that region is doing in a reflex way.

3. The great difficulty in doing a cholecystectomy. This is wholly a matter of technic; the experienced can remove a gall bladder in practically the same time, in fact, quicker and with less immediate shock than he can do a proper cholecystostomy in a given case.

4. The possibility of leaving stones in the common duct. There is no excuse for leaving stones in either duct, if the surgeon has sufficient ability to justify him to undertake gall bladder surgery, granting there is always a possibility of an hepatic calculus coming down later.

There is but one type of operation, and that is to remove the organ by tying off the cystic duct, which will include the entire blood supply of the organ. Some surgeons have featured the care of the stump of the cystic duct. There has been considerable argument as to the necessity or advisability of covering the stump with

peritoneum. It is now fairly well determined that this is only a matter of the surgeon's choice. The matter of drainage for the stump also has come in for its share of discussion, and again seems to be one wholly of choice of the operator. A little bile in the peritoneal cavity does no harm further than to cause a slight temporary irritation and a few resulting adhesions; these adhesions will be less than those following a bile saturated gauze pack, which, in turn, must be withdrawn. Naturally, with some there is an element of personal professional conscience in the fact that the drain is put in.

The stump should be tied off as closely to the junction of the cystic and common ducts as possible without injury to the common duct by the ligature; No. 3 chromic cat gut should be used, and a single reef knot should be tied by the surgeon himself. As to the position of the ligature on the cystic duct. It has been shown by animal experimentation that where the cystic duct was tied off, as little as half an inch from the common junction, that in from five to seven months there was a marked dilatation of the remnant, and if it were tied off farther away, the dilatation was correspondingly greater. In such cases, where the entire cystic duct was removed, there was no marked dilatation even of the common duct, but that there was a patent condition of the sphincter of Oddi. Careful dissection will loosen the attachment of the gall bladder from the liver, and forego the possibilities of hemorrhage. Such little oozing as may occur, can easily be cared for with a moist sponge under pressure of a retractor during the operation. Again, a little blood in the peritoneal cavity will do no harm. After a proper toilet has been made, the abdomen is closed without drainage.

There is a condition in which the gall bladder is involved where external drainage of the surgical field should be made, and that is where an abscess is walled off about the gall bladder.

Willis, in a series of reported cases, is a strong exponent for the closing of the abdomen without drainage. He believes the results are better, the patient more comfortable and the dangers no greater. He says that any spilled bile can be wiped out of the peritoneal cavity with saline solution much more thoroughly than it can be drained out.

Hilton claims that there are four chief dangers of cholecystitis, which are as follows: Acute suppurative or gangrenous cholecystitis; malignant disease of the organ; cholangitis and operation in the too long delayed cases. All of these dangers can be avoided by early operation. ONLY BY EARLY OPERATION can the present high mortality from gall bladder disease be lowered. The mortality in skilled hands runs from 2 per cent to as high as 4 per cent in general hands.

Cancer is found in 6.1 per cent of all unoperated cases where death is due to gall bladder disease.

The saving of from 2 to 4 per cent from cancer death by operative procedure would seem worth while, and the importance of this should be urged by the profession.

The writer's series for 1921 showed:

Women, 14; 11 had had children.

Men, 3.

Average age, 42.6 years.

Eleven give history of typhoid fever.

Eleven give history of having had influenza, and eight of the eleven date the beginning from that time.

One had been a sufferer with migraine for years.

Six had cholelithiasis.

Fourteen had pyorrhea from moderate to severe.

OPERATIONS DONE:

Cholecystostomies, 4.

Well, 2; improved, 1; dead, 1 (shock 36 hours).

Cholecystectomies, 12.

Well, 10; improved, 1; dead, 1 (Pul. Emb. 8 days).

Cysto-duodeno-enterostomy, 1.
Well.

No other untold complications.

COMPARATIVE RESULTS: D.

Adams gives a rather comprehensive summary of his experience covering nine years in 230 cases of gall bladder disease that came to operation: 221 were women; 90 per cent had had children; 9 were men; the average age was 44 years. Post operative conditions of 207 were studied for a period of six years. There were six complications. One cholecystectomy became obstructed; two primary wound infections occurred in drained cholecystectomies; one post-operative pneumonia and serious wound infection; one abortion occurred on the twelfth day following operation; two cases acquired right sided femoral phlebitis. Results tabulated as follows:

Cholecystostomy: 135 Well 71.8%

Improved 18.4% Unimproved 9.8%

Cholecystectomy: 70 Well 82.8%

Improved 10. % Unimproved 7.2%

He believes that the excision of the diseased bladder offers the best results.

SUMMARY: The tests of a successful operation for cholecystitis are:

A. Whether the infection of the bile channel clears up, the liver function returns to normal and the patient does not suffer from symptoms referable to adhesions or from other symptoms recurring from inflammatory reaction in the operated area. The experience of Monserrat and others is that a very considerable proportion of cases of cholecystitis treated by drainage fail to measure up to the test. A considerable number of cases treated by cholecystostomy suffer ill health of one kind or another with symptoms referable to the existence of the gall bladder as a source of infection, ill health due to persistent chronic cholangitis, with chronic pancreatitis, recurrent attacks of pain and tenderness in the neighborhood of the wound, gastric distention, spasm, and sometimes vomiting due to angulation of the pylorus or duodenal

adhesions. To avoid these complications and get rid of a potential source of infection in the bile canal, it would appear advisable to remove the gall bladder which had undergone cholecystitis of whatever variety.

B. Cholecystostomy is indicated in cases where the patient's enfeebled condition limits the operation to drainage, without further examination. The indications for such a procedure are general, not of local character.

C. It is necessary to make certain that no obstruction remains in the hepatic or common ducts; this being demonstrated beyond doubt, there is no need, even in cases where jaun-

dice exists, to provide drainage for the ducts.

D. The indication for external drainage is an associated pancreatitis and this may be equally as well done internally.

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INSTRUCTION OF MIDWIVES IN SAN MIGUEL COUNTY.*

LOUISE WILLS, R. N., County Public Health Nurse, Las Vegas, N. M.

Prior to 1921, any woman or girl, in San Miguel County, who so chose, could be a midwife. Without authorized advice, experience or training, any person desiring could officiate, usually alone, at the all important and sacred time of birth.

Well-to-do persons have always been able to secure skilled advice and care, but the great middle class and the other that we term indigents, have been left to shift for themselves, which, as statistics show, has resulted in an extreme waste of human life and in our very high infant mortality rate. San Miguel County had the highest infant mortality rate in New Mexico in 1921, being 278 per 1,000 living births, according to returned reports.

Women who have had a little experience in obstetrical nursing often resent any advice or supervision from a trained health official. Especially is this true among the lower classes

of the Spanish-Americans. Their habits and fatalism so bind them that it is difficult to introduce approved methods of prenatal, maternal and infant care.

But, by degrees, after the establishment of San Miguel County's full time health department, people found it convenient to come or phone to the department's office for advice on all health matters. Among others, many prenatal cases were recorded. With each such record the name and address of the physician or so-called midwife was also recorded.

As soon as possible the county nurse called upon those women acting in the capacity of midwives, and also upon others whose names were obtained from the birth registration certificates, and finally succeeded in getting several of them to consent to attend a meeting in which they would receive some instruction along the lines of asepsis, prophylaxis and gen-

eral obstetrical care. Through the efforts and influence of the health officer four others were persuaded to attend.

One of them generously offered her home, which was spacious in comparison with many others. Her "spare" room was selected, a four-walled inclosure twenty by twenty-two feet. It was impossible to remove the big square piano (as it had been placed in the room before one of the four adobe walls was complete), so it was pushed into one corner and there served as a table on which to demonstrate. The bed and the oil stove took up much of the remaining space.

The articles for demonstration were purchased by the department, except the linen, which was given to the County Linen Closet by the Women's Club.

There were eleven present at the first meeting, all mothers themselves; all accustomed to attending obstetrical cases alone; all unaccustomed to concentrating, much less to the taking of notes. Six of the eleven were unable to write or read in Spanish or English. It was impossible to impart much to them orally. Each procedure had to be vividly demonstrated. The interpreter, one of the women, was a little inclined to add her own ideas, according to her experience, to the instructor's explanations. Thus the nurse was not always sure that they were hearing just the right thing.

In order to hold their attention and make them wish to return for further instructions, something spectacular yet comparatively easy had to be given in this first meeting. Deviating somewhat from the previously outlined, but tentative, course, bed-making was selected. The instructor first made the bed, explaining each procedure. Every woman had the opportunity of demonstrating back. One hour and a half was spent on making the closed bed and its preparation for confinement. Each was given some illustrations and literature (in Spanish) on home and personal

hygiene. The women left that afternoon feeling that they had something tangible to show for their afternoon's efforts. Each promised to come two days later to the next meeting.

Fourteen answered the roll call on the following Thursday. This was the beginning of the outlined course. It was carefully explained that they would be expected to attend every meeting; only one absence would be allowed in order to acquire the department's certificate; that the course would consist of ten lessons, terminating with an examination on the whole, accompanied by a physical examination of each member by the health officer; that this instruction was most important in many ways; that the health of the midwife herself must be good, and that strict adherence to asepsis would often save life, besides eliminating physical defects that later cause such serious handicaps.

The second lesson was equally well attended. Normal pregnancy was simply explained. Flowers were used to demonstrate the principles, their pollination, their nurture and the development of the seed, how a good plant brings forth good seed. The fundamentals of personal hygiene of the pregnant, what to have on hand for confinement, and the infant's layette, were demonstrated and discussed.

At the third meeting the following topics were explained and illustrated: the obstetrical bag, the preparation on entering the home and adverse symptoms, such as prolonged edema, spots before the eyes, cessation of fetal movements.

The fourth meeting was taken up with the care of the patient immediately before delivery. The proper technic for the enema, bed, bath, etc., were thoroughly demonstrated and discussed.

The fifth lesson was on the course of labor. This is the best given by a physician, but as it was impossible to get a doctor the nurse explained the various stages, stressing the protection of the perineum; delivery of

the shoulders and the body; proper technic in the cutting and care of the umbilical cord; in case of asphyxia, what to do; the examination of the placenta; the kneading of the fundus; abnormal presentation and **when to call a doctor.**

At the sixth meeting they were cautioned against the complications of labor; placenta previa, internal hemorrhage, breech presentation, dry labor, eclampsia, prolapse of cord, general prostration, etc.

The seventh time the post-partum care was given, which included the immediate care after delivery; daily care thereafter for ten days, and the diet. At this time an attractive tray was prepared. The food was eaten, after class, by the members and they enjoyed it immensely. This gave a note of pleasure to our meetings which, I believe, prevented several who were beginning to weaken at the somewhat complicated instructions, from dropping out.

The eighth time the care of the infant was carefully demonstrated, emphasizing the use of silver nitrate in the eyes, the use of sterile dressings to prevent umbilical infections, the baby's bath, his nourishment, his proper resting place and time for rest; and the adverse symptoms of infancy.

At the ninth meeting the whole time was taken up by the members demonstrating to the instructor what they had learned. Each had her individual exhibit of the supplies for confinement, supplies for the baby, a washable bag and its proper contents. The instructor explained a few other safety rules for midwives.

The tenth and last lesson was the examination. Each member was examined separately. There was nothing written. All was through demonstration and oral explanation.

There were seven women who had not missed a meeting and passed an excellent examination. These were awarded certificates signed by the health officer, stating that they had successfully passed the examination for midwives, following instruction by the nurse. At the completion of

their course the instructor planned for them a "Graduating Party." As all of the class members were Catholics, the Father was asked to present the certificates. In his talk to them he praised the work and said that all they had done received his hearty endorsement. The party ended with music and refreshments, the latter being served by the class members as they had been taught during the instructions. The names of the "graduated midwives" were made public and a list sent to each doctor, urging him to call upon those authorized by the health department rather than upon those who had had no training.

From time to time the officials of the health department inspect these midwives to see that they are following instructions and keeping the pledges that they signed upon receipt of their certificates.

Such sterile dressings as gauze for the cord, perineal pads and medicines, as silver nitrate, argyrol and boric acid are furnished them by the department.

The success of the first class spread rapidly, even reaching to isolated parts of San Miguel County. The next class for midwives was organized in Trementina, a little Spanish settlement 65 miles from Las Vegas and the railroad. Through the efforts of the mission worker there, much of the preliminary work of the nurse was eliminated. This class, though well attended, did not "graduate" on account of the nurse having to leave to begin work in the schools before she could give the examination. However, these women (about fifteen in number) are anxious for their certificates and are now reviewing their lessons that they had last fall and have requested that the nurse take time to come to them and give the examination necessary for their certificates. Through popular demand a third class will be organized and taught in the Los Vijeles neighborhood as soon as school closes. Already there are more than enough applicants for this class, ten being the preferred number.

The result of these classes has been most satisfactory. A lowered infant mortality, less cases of puerperal septicemia, less ophthalmia neonatorum, a higher registration of births and a friendlier feeling generally between the midwife, the doctor and the trained nurse, are some of the beneficial results already obtained.

SECOND ANNUAL SESSION OF NEW MEXICO HEALTH OFFICERS.

On April 27, the second annual conference of the local health officers of New Mexico, with the State Bureau of Public Health, was held at Albuquerque. The meeting was, in part, a joint session with the State Public Health Nurses' Association.

At the morning session, the President, Dr. S. D. Swope, of Deming, read a paper on school medical inspection in his county and demonstrated a model of a sanitary privy that he had designed especially for the use of temporary camps. Miss Louise Wills, Public Health Nurse of San Miguel County, described her experiment in teaching midwives. This paper appears in this issue of *SOUTHWESTERN MEDICINE*. Following Miss Wills, Miss Margaret Tupper, Chief of the Divisions of Child Hygiene and Public Health Nursing, State Bureau of Public Health, discussed the value of public health nurses to county health departments. At the close of the session an opportunity was given for the examination of exhibits brought by the various public health nurses and for viewing wax models of syphilitic lesions.

In the afternoon, communicable diseases and vital statistics were the topics for discussion. Dr. R. M. Schwartz,

Santa Fe County Health Officer read a paper on typhoid fever control, describing the outbreak at Salem, Ohio, in the control of which he had an active part. Miss Greenfield, Chief of the State Public Health Laboratory, demonstrated some procedures, laying particular stress on methods of collecting and forwarding specimens.

A banquet at the Alvarado Hotel was attended by 26 members of the conference. Following it was a round-table discussion of problems presented by the various local health officers and the State Bureau of Public Health. The meeting closed with the election of officers. Dr. S. D. Swope, of Deming, was re-elected President and Dr. G. S. Luckett, State Bureau of Public Health, Santa Fe, Secretary. Selection of the next meeting time and place was left to the officers.

SAFE HYPNOSIS.

When the physician finds it necessary to prescribe a hypnotic, two questions occur to him: Is it safe? Will it induce a drug habit? If safe, it will put the patient to sleep without risk of immediate or subsequent reaction involving pain or injury of any kind. If non-habit-forming it may be administered as often as the condition of the patient requires, or discontinued at any time without any more inconvenience to the patient than if it had never been taken.

These conditions are said to be perfectly fulfilled in Chloretone, a Parke, Davis & Co. product, which acts upon the dendritic processes in the brain, relaxing them so that both sensory and motor impulses are inhibited. This effect disappears gradually without, apparently, any more alteration in the functions of the nerve filaments than that which follows the sleep of ordinary fatigue.

Chloretone is given for its hypnotic effect in a dose of 5 grains, to be repeated, if necessary, in half an hour, and at this interval, in exceptional cases, up to 20 or 25 grains. It is indicated in the insomnia of excitement, in sthenic cases only.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

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DR. PAUL GALLAGHER, Mills Building, El Paso, Texas.....	Associate Editor
DR. J. W. ELDER, Albuquerque, New Mexico.....	Associate Editor
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SOCIAL MEDICINE.

There will appear in this issue of **SOUTHWESTERN MEDICINE** two specific references to "State Medicine" and one paper which reports an experiment which should be of interest to the profession.

The paper of Dr. Luckett gives the ideas of a man who sees the problem from the standpoint of a Health Officer, and the experience of Dr. Luckett and the results of his work in New Mexico should make his statements of interest to every one who thinks seriously about the problems presented. The reorganization of the Health Department in New Mexico has been a notable achievement, and one which interested men in Arizona can study with profit. From being the most backward state in the union in public health matters, New Mexico, within three years, has taken her place in the front rank, is within the official registration area, has a full time health commissioner, and nine full time county health officers. Dr. Luckett's paper excited considerable discussion, mostly the usual frenzy which the term "State Medicine" creates in our conception. A careful perusal of the paper will show that the dominant idea is that, should state control of medical facilities and practice ever be realized, it will be solely because of the indifference of the general medical profession to social conditions and needs and their

inability to see more than the individual patient.

Dr. Gustetter's address handles the questions involved in "State Medicine" in what is regarded as the orthodox manner, i. e., unqualified opposition and his remarks will meet the approval of the great body of medical men. His position is well buttressed by the specific illustration he has selected,—the Shepherd-Towner Bill, regarding which there is little argument among medical men.

This address, however, does overlook one fact; that is, that the Constitution of the Association, which is quoted, recognized that State Medicine is a factor to be dealt with by organized medicine. When we are called on to "educate the public in the great problems of state medicine," there was no intent in the Constitution to declare that "State Medicine" is a menace regarding which we are to educate the public, but that it is something in which we are to interest ourselves, form a constructive program and then educate the public regarding that program.

Here is the common ground on which Dr. Luckett, the formal state constitution adopted by the American Medical Association, containing the above quoted clause, and Dr. Gustetter, can all unite.

The third paper is the one by Miss Wills, the Public Health Nurse for San Miguel County, New Mexico. This is the report of an interesting innovation.

She undertook to educate a certain number of midwives, who would inevitably officiate in a large number of maternity cases, in the rudiments of surgical cleanliness and the handling of such cases. This paper was submitted by the Associate Editor for New Mexico with the suggestion that it might not be regarded as proper for publication. The editor (managing) does not hesitate to record his unqualified approval of such an experiment,—if it may be so called; anything which lessens infant mortality, diminishes the dangers of childbirth, and prevents the crippling effects of post-partum infections in infants must have our approval. A significant sentence in the paper is in the paragraph recording the fifth lesson in which the remark is made that it was “impossible to get a doctor” to give this lesson. It would be interesting to know what reasons a doctor would give for refusing to co-operate in such a work.

W. W. W.

THE PRESCOTT MEETING.

The writer attended his first Arizona medical meeting at Prescott, in 1909, since which time he has missed only one meeting of the Association. This was the Nogales meeting where the famous chicken fight was held, at which the collective Arizona medical ingenuity and prescience was pitted against the Mexican knowledge of roosters. The members of the Association returned to the American side poorer by about \$150.00 but much richer in knowledge of the possibilities in a cock fight.

To revert to the Prescott meeting; we went there again in 1915. Other Prescott meetings, prior to 1909 had left their impressions in the memories of the older members. All of these memories brought an unusual attendance at the 1922 gathering, at which the Yavapai County Society outdid all previous efforts, and this is saying much. Only one visitor on the program failed to attend, and four members who were down for papers failed to appear. On the crowded program, which

finally required an extension into the afternoon of the third day, these absences only assisted in facilitating the presentation of papers.

The most unusual, and the most enjoyable portion of the program, was the trip to Jerome on the second day and the entertainment offered there. The Prescott-Jerome highway is one of the finest pieces of engineering in road-way construction to be found anywhere and the motorcade made the trip both ways without accident or serious delay. In Jerome, the ladies of the party were taken into the Verde Valley and entertained at the Company's Ranch House, while the members and visitors were taken into the Verde Company's mine, where a first-aid contest was held between teams of the two companies. After this the party was taken to the 1950-foot level and then out to the surface. Competent guides and officials of the copper company explained to the visiting novices matters of interest regarding mining of ore and handling of machinery in the mine. The afternoon session in Jerome was held in the company's guest house, after which a banquet (inadequately called a “luncheon” on the program) was served in the Lodge Hall; following the banquet the two medico-legal papers were given and discussed, together with the paper on “Kidney Function.” The party then returned to Prescott, reaching there about midnight.

The dinner dance at the Yavapai Club in the evening of the first day was the chief social function, and was remarkable for the fact that as many ladies were in attendance as there were men. A larger proportion of the doctors brought their ladies to this meeting than to any previous meeting of the Association. Steps were taken to form a Ladies' Auxiliary to the Association, both for social enjoyment and for assistance in the educational propaganda of the Association. The President's address, which is given in this issue of the Journal, was read at the close of the banquet. It contains food for much serious thought, its recommendations being directed toward a constructive program for the organization.

The arrangements for the meeting were ideal, the room well arranged for presenting and illustrating papers, the seats were comfortable and the location convenient to the headquarters.

The luncheon at the Country Club and the open meeting for the House of Delegates at the Owl were the two other chief general gatherings.

A categorical review of the papers presented would be uninteresting; they will appear, in due course, in *SOUTHWESTERN MEDICINE*.

W. W. W.

JOSEPH N. McCORMACK.

In the death of Joseph N. McCormack, of Louisville, Ky., we witness the passing of one of the notable figures in American medicine. The outstanding services of this "grand old man" are recorded in the obituary published in the *Journal of the American Medical Association*, for May 13th, 1922.

The object of this brief notice is to pay tribute to his service as Chairman of the Committee on Reorganization of the Association, in which capacity he visited county societies from ocean to ocean, teaching them the rudiments of organization work and the principles of success in medical society endeavors. He visited the county society of which the writer is a member, in 1909, and the inspiration and enthusiasm imparted by Dr. McCormack, at that time, has never departed, and it is easy to understand that when Dr. McCormack laid down this work, it required a corps of workers sent out by the Association to accomplish indifferently what this one organizing genius had undertaken single-handed and succeeded with. If there is one man, more than any other, to whom credit is due for the present proud position of the American Medical Association in public affairs, this should go to Joseph Nathaniel McCormack, of Louisville, Ky.

A. G. SHORTLE,

(*Albuquerque, N. M.*)

RESOLUTIONS.

RESOLVED, First: That in the death of Dr. A. G. Shortle, we recognize the passing of a man of energy and varied activities; a pioneer in his line of work in this city; a good citizen who always gave liberally of his valued counsel and financial aid toward the sanitary and material upbuilding of his town and state, and a valued member of our Society.

RESOLVED, Second: That copies of these resolutions be spread upon the minutes of this Society, sent to the family of Dr. Shortle, and published in the official journal.

THE BERNAILLO COUNTY MEDICAL SOCIETY.

W. HOPE

P. G. CORNISH

L. B. COHENOUR

ARNO KLEIN,

Committee.

Following a critical illness of more than a month, Dr. A. G. Shortle, who was President of the Southwestern Medical and Surgical Association during the years of 1915-1916, died at the Presbyterian Sanatorium in Albuquerque, N. M., May 26th, 1922. His death resulted from Septicemia.

Dr. Shortle was active in everything that was for the good of Albuquerque; he took a very active interest in health affairs, both of the state and nation. He had been a member of the special committee of the National Tuberculosis Association on migratory consumptives. He was also a member of the American Climatological and Clinical Society and was a member of the American College of Physicians. He had been, for a number of years, a member of the official board and one of the trustees of the First Presbyterian Church in Albuquerque.

The Albuquerque Rotary Club was organized by him, and during the time that he was its president he induced the club to get behind the movement for the commission form of government. It was due to his efforts, more than to any other one man, that the commission form of government was established, and much good accrued to this community from that work.

Dr. Shortle established the first tuberculosis sanatorium in Albuquerque and builded an institution where the highest type of scientific treatment was, and still is, given. He was the first man in America to begin the use of heliotherapy which he began here

early in 1912. He devoted considerable time to writing and many of his medical articles have been published in various medical journals all over the country; among those which attracted the most attention are the following:

"Climate as a Factor in the Treatment of Tuberculosis" (Illinois Medical Journal, September, 1908). Read before the Englewood Branch of the Chicago Medical Society July 7, 1908.

"Artificial Pneumothorax" (New Mexico Medical Journal, November, 1913). Read before the joint meeting of the New Mexico Medical Society and the New Mexico Society for the Study and Prevention of Tuberculosis, Albuquerque, N. M., Oct. 4, 1913.

"The Occurrence of Fluids in the Pleural Cavity During Treatment by Artificial Pneumothorax" (New Mexico Medical Journal, after October, 1914). Read before the joint meeting of the 33rd Annual Session of the New Mexico Medical Society and the 4th Annual Session of the New Mexico Society for the Study and Prevention of Tuberculosis, Albuquerque, N. M., October 7, 1914.

"The Treatment of Pleurisy with Effusion." Read before the 2nd Annual Meeting of the Southwestern Medical and Surgical Association, El Paso, Texas, December 9-11, 1915.

"The Ultimate Results in the Treatment by Artificial Pneumothorax" (Journal of the A. M. A., October 28, 1916, Vol. LXVII.)

"Heliotherapy in the Treatment of Tuberculosis." Read before the Medical and Surgical Association of the Southwest at El Paso, Texas, December 16, 1916.

"The Importance of the Routine Wasserman in Tuberculosis (The Southern Medical Journal, Vol. XII, No. 3, March, 1919). Prepared for Section on Medicine, Southern Medical Association, Twelfth Annual Meeting, Asheville, North Carolina, November 11-4, 1918, postponed one year on account of influenza epidemic.

"Some Common Mistakes in the Administration of Artificial Pneumothorax" (The American Review of Tuberculosis, Vol. III, No. 7, September, 1919).

"A Report of Four Recent Cases of Thoracoplasty" (The Journal of the A. M. A., January 21, 1922, Vol. 78), Shortle & Gekler.

Dr. Shortle was a strong supporter of the State Department of Health and was the first physician appointed as a member of that board. He retained his position when the board was merged into the Public Welfare Department and was elected secretary of the enlarged body after he had declined the presidency.

Dr. Shortle was born in Tipton, Indiana, February 17, 1871. He attended the Indiana

State Normal, graduated in 1887. His medical education was received at Baltimore Medical College, from which he graduated in 1896. He did post-graduate work in the Medical Department of the University of Chicago and in the University of Heidelberg, Germany. Dr. Shortle began the practice of medicine in Yorktown, Ill., in 1897. From there he went to Chicago. In 1903 he married Alice Stanley Mitchell of Chicago. Mrs. Shortle and four children, Margaret, Alice, Sarah, and Samuel survive to mourn his death.

Dr. Shortle came to Albuquerque from Chicago in 1908. He was a man who, while always very busy with his profession and studies, made many warm friendships. He was always kind and sympathetic, and took an intense interest in the people he knew and in his family. He leaves a memory to be prized and cherished by all who knew him.

(Contributed.)

AUGUSTUS E. MARDEN,

Phoenix, Ariz.

In the death of Dr. A. E. Marden, on May 19th, one of the pioneer physicians of the United States Indian Service, passed away. For more than twenty-five years, he devoted his life to the study and amelioration of the physical ills of the Indians in the western states, the last eleven years being spent at the Indian School at Phoenix, the largest school for Indians in the United States.

Dr. Marden was a faithful member of the county, state and national medical societies, and during his life of service, accumulated and turned over to the Government an enormous amount of information about the health and physical needs of the Indians.

Dr. Marden graduated from the Boston University School of Medicine in 1889, and was 58 years of age at the time of his death.

CHESTER D. UMBERHINE,

Santa Fe, N. M.

While visiting at Frankfort, Ind., Dr. Chester D. Umberhine, of Santa Fe, N. M., died on May 12th, the cause of death being organic heart disease.

Dr. Umberhine graduated from Rush Medical College in 1885, and had been located in New Mexico since 1918. He was a member of the New Mexico Medical Society.

DOLPHUS H. BELL,

Silver City, N. M.

Dr. Dolphus H. Bell, a practitioner of Silver City, N. M., died on May 5th, at the age of 35. He was a graduate of Washington University Medical School, and was licensed in New Mexico in 1915.

BOOK REVIEWS

THE SPLEEN AND SOME OF ITS DISEASES: By Sir Berkeley Moynihan of Leeds, England. 129 pages with 13 diagrams. Philadelphia and London: W. B. Saunders Company, 1921. Cloth, \$5.00 net.

After brief discussion of the anatomy of the spleen and a historical review of the splenic surgery the author takes up the functions of the spleen in its various aspects, namely, as a part of the hemopoietic system, of the retico-endothelial system, of the digestive system and of the endocrine system. There follows a chapter devoted to the pathology of the spleen and a most interesting description of the clinical and associated phenomena of the splenic disease, anaemia, jaundice, petechial hemorrhages, muscular weakness, pyrexia, splenomegaly, leucocytosis, hemorrhagic diathesis and urobilinuria. A chapter is written on each of the diseases in which the spleen is at fault or plays an important part, pernicious anaemia, leukemia, Hodgkins disease, splenic anaemia, hemolytic jaundice, Gaucher's disease, von Jaksch's disease and polycythemia. In each of the above diseases the pathologic relations of the spleen with other structures involved, liver, bone marrow, gall bladder, etc., are graphically shown by an ingenious diagram illustrating and describing the changes in the various organs involved. A new and plausible explanation of the pathogenesis of portal and biliary cirrhosis is presented. The two forms of hepatic fibrosis are regarded as variants of one process; portal cirrhosis as due to the entrance of irritating substance through the portal vein, biliary cirrhosis as the result of infection through the common bile duct or the splenic vein. The value of splenectomy is either through relief of turgescence by removal of one source of blood supply or by the removal of poisons sent direct from the spleen. The work is well written and contains a mass of valuable first-hand information and discussion.—E. A. D.

A MANUAL OF CLINICAL LABORATORY METHODS: By Clyde Lottridge Cummer, Ph.B., M.D., Associate Professor of Clinical Pathology, School of Medicine, Western Reserve University; Associate Clinical Pathologist, The Lakeside Hospital; Director of Medicine and visiting physician St. John's Hospital, Director of Laboratories, St. Alexis Hospital, Cleveland, Ohio. Lea and Febiger: Philadelphia. Price, \$5.50 net.

This clinical laboratory manual is illustrated with 136 engravings and 8 plates and contains 462 pages which deal with all of the various clinical laboratory methods of the present day. The author has followed the plan of presenting the subject matter: first, as an outline of the routine examination; second, a description of the simpler qualitative methods most often used; third, a description of quantitative methods; and fourth, a discussion of the findings of the various morbid conditions. It includes clinical methods for

the examination of the following: blood, urine, gastric and duodenal contents, feces, sputum, and the examination of body fluids and exudates as well as various miscellaneous methods. The last chapter which deals with bacteriological methods will be found to be very helpful. This work should be valuable to the busy practitioner and would serve as a good manual in the hands of the medical student.—V. S. R.

1920 COLLECTED PAPERS OF THE MAYO CLINIC, Rochester, Minn. Octavo of 1392 pages, 446 illustrations. Philadelphia and London: W. B. Saunders Co. Cloth, \$12.00 net.

The 1920 Mayo Clinic Papers cover a wide range on medical subjects though the majority are surgical in nature. There are three interesting heart studies by Willius on Chronic Bradycardia, Angina Pectoris and a Congenital Heart Disease report. The papers from the section of Dermatology and Syphilology are uniformly excellent. Stokes contributes a splendid paper in philisophic vein on the Clinical Approach to Syphilis and also an excellent general study of the Applications and Limitations of the Arspenamins in Therapeutics. The latter article is replete with observations and suggestions of the greatest value and should be read by every physician who treats syphilis. The writer urges the intensive treatment only when the infection is an early one and the spirochetes are accessible in blood stream and tissues. In late cases when the organisms are walled off in fibroses and infiltrations the hope of radical spirillicidal action is illusory and the drug should be employed in a way to utilize its immunity stimulating power, that is, in moderate dosage at safe intervals for long periods, which is to say one-half increased to two-thirds of the Ehrlich maximum at intervals of one week. An average series is six to eight injections, an average rest is four to six weeks, an average number of such series is three or four. Stokes advocates the simultaneous use of mercury and arspenamin but disapproves of the use of insoluble salts intramuscularly, preferring inunctions. In an early case he believes it inexcusable to use less than eighteen to twenty-four arspenamin injections in the first year and some three hundred inunctions in courses, which will run over that period. O'Leary presents a paper on the provocative Wassermann as used in the Skin Department of the Mayo Clinic. It consists of one three decigram dose of arspenamin followed by seven Wassermann tests at intervals of twenty-four hours. This method adds ten to twenty percent to the acuteness of the reaction. The publication of Rosenow's bacteriological studies in influenza and pneumonia are continued in this volume to the extent of some 145 pages.

Among the surgical diseases treated the thyroid gland occupies a pre-eminent position. Articles by Drs. C. H. Mayo, Judd, Boothby, Sistrunk, Pemberton, Wilson and Fitz, cover a wide range of subjects devoted to the goiters and tumors of the gland, with the results of



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operation, as well as the relation of hyperthyroidism to other diseases. Any surgeon who operates on the thyroid, however infrequently, can ill afford to be unfamiliar with the sound surgical advice given in these papers. The clinical data, surveys and recommendations regarding operations and statistics given are invaluable. It is impossible in a short review to adequately touch upon the points of interest and importance, the resumé of a year's work by a great clinic upon this important organ.

Other articles treat of anaesthesia, group practice in medicine, the hospital, the pathologic field review, dentistry as related to systemic disease, orthopedics and a wide range of subjects related to surgery.

Dr. W. J. Mayo contributes an article on

Mortality and End Results in Surgery that presents many interesting speculations.

Conclusions resulting from such a large experience are of vital importance. It widens our views when we learn that there is greater tendency to excise ulcers without gastro-enterostomy; that the clinic had closed over 200 old gastro-enterostomies, many of them their own cases; that surgery in the female pelvis is becoming more conservative; that surgery of the biliary tract yearly presents new view points; that the results of operation for carcinoma of the large bowel are better than for malignant disease elsewhere; and that there are professional as well as altruistic reasons for working toward lessened mortality and better end results in our surgical practice.—E. A. D.-E. B. R.

PERSONALS

ALBUQUERQUE, N. M.—The report comes, indirectly, that Dr. Van Atta is to be operated upon, in Denver, for chronic appendicitis. He was in Denver attending a class in radium therapy.

HUMBOLDT, ARIZ.—When the Humboldt properties resumed operation recently, the hospital was reopened and Dr. Robt. T. Franklin of Glendale, Ariz., secured to take charge. The opening of this property and hospital is good evidence of the tendency to return to normal on the part of the mining conditions in the state.

JEROME, ARIZ.—In the reorganization of the forces at the United Verde Hospital, at Jerome, Dr. James Thom, formerly of Clarkdale, was moved to Jerome where he has, among other duties, the management of the x-ray department. Dr. Thos. J. Cummins, formerly superintendent of the State Hospital, in Phoenix, takes charges of the United Verde work in Clarkdale.

Dr. James Moore, until recently located in Jerome with the United Verde Extension hospital, upon resumption of the work at the smelter at Clemenceau, moved to the latter place, where he was formerly located.

One of the visitors at the recent Prescott meeting, whose presence was especially pleasing, was Dr. A. J. Murietta, formerly chief surgeon of the United Verde Hospital.

PRESCOTT, ARIZ.—Dr. W. D. Sheldon, of the Mayo Clinic, and his family, are spending some weeks, as the guests of Dr. John W. Flinn. Dr. Sheldon gave the Address on Medicine at the recent meeting in Prescott.

On June 1st, St. Luke's Home transferred all their patients from the sanitarium in Phoenix to "St. Luke's in the Mountains" at Prescott, where they will remain until October 1st. The patients from "St. Luke's on the Desert", at Tucson, were also taken to Prescott for the summer.

PHOENIX, ARIZ.—Among the invited guests of the recent California State Medical Association, at Yosemite, were Drs. D. F. Harbridge, and Win Wylie, of Phoenix.

Dr. Harbridge read a paper on "Sympathetic Irido-cyclitis", and Dr. Wylie a paper on "Medical Defense."

These guests report a very enjoyable visit to the "Park", and a cordial reception of their respective subjects.

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PRESENT ASPECTS OF THE ETIOLOGY AND TREATMENT OF BRONCHIAL ASTHMA*

Dr. Geo. Pinness, Los Angeles, Calif.

The literature on bronchial asthma has become exceedingly voluminous since Meltzer (15) in 1910 pointed out that asthma was a clinical manifestation of anaphylaxis. That the patient with asthma is sensitized to various foreign proteins which may be either inspired or ingested from without the body, or absorbed from a focus of infection or suppuration from within the body.

Hypersensitiveness or anaphylaxis, as described by Vaughan (1) in 1913, means that when foreign protein is introduced into the blood stream or tissues, it stimulates certain body cells to liberate a specific ferment that will digest the specific protein. When the protein first comes into contact with the body cells the latter are unprepared to digest the former, but this function is gradually acquired. The protein contained in the first injection is slowly digested and no ill effects are noticed. However, when subsequent injections of the same protein are given, the cells prepared by the first injection pour out the specific ferment more promptly, and the results are determined by the rapidity with which the digestion takes place. The poisonous group in the molecule may be set free so rap-

idly and in such large amounts that they are sufficient to produce anaphylactic symptoms or even kill the animal. To produce sensitiveness, the protein must enter the tissues before it is entirely split, and usually enters these tissues through mucous membrane unless injected hypodermatically.

Blackfan (2) states that the hypersensitive state may be present at birth, this being the rule in the greater percentage of cases, and that such conditions as asthma, eczema, urticaria and other allergic conditions may develop when the first protein is given. He further states that sensitization may be acquired or can be conveyed by the mother to the child, or may be inherited.

In the study of asthma patients, before making a definite diagnosis of the same, one must rule out that group of conditions which so closely resemble it. The writer does this by carrying out the following procedure: (a) A careful history is obtained, particular attention being paid to the family history as it is not infrequent for other members of the same family to have allergic conditions, occasionally the allergy being caused by the same proteins. Although all ages

*Read before the 40th annual meeting of the New Mexico Medical Society at Gallup, April 28-29, 1922.

are liable, still one may obtain a clue as to the class of proteins to which one is sensitive, and as the age of onset increases, the frequency of sensitization decreases. A history of whether or not attacks are seasonal or perennial is of importance; as, for example, seasonal asthma is usually due to pollen sensitization, while the perennial type may be due to any group of proteins. Occupation is an important etiological factor, since the etiology is often traced through this information. For example, bakers, tailors, hostlers, etc., this group having become sensitive through the handling of the materials in the course of their daily employment. A history of certain skin conditions, such as urticaria or eczema, are not only predisposing factors, but have definite relationship to bronchial asthma, as most cases with a history of eczema in early life become asthmatic later in life, the offending protein being the same in each instance.

(b) A careful physical examination must be made to rule out the group of conditions, such as cardiovascular diseases, acute and chronic bronchitis, chronic tuberculosis with fibrosis, in which the dyspnea is mechanical. The teeth and tonsils and accessory sinuses should be investigated for foci of infection, and cleared up.

(c) Laboratory studies of the sputum, nasal secretions and blood should also be made, and, lastly, protein tests made to determine the specific offending protein or proteins.

BRONCHIAL ASTHMA

CLASSIFICATION OF WALKER

Sensitive to Proteins

Asthma throughout the year, due to—

- Animal
- Food
- Bacteria
- Dust

Seasonable asthma due to—

- Pollens

Non-Sensitive to Proteins

Asthma throughout the year, due to—

- Bacteria
- Endocrines

Seasonable asthma due to—

- Bacteria

CLASSIFICATION OF COOKE

1. Anaphylactic

- (a) Respiratory
 - Animal emanations
 - Vegetable
- (b) Intestinal Tract
 - Foods
- (c) Foci of Infection
- (d) Subcutaneous tissue of intravenous injection
- (e) Therapeutic serums

2. Non-Anaphylactic

- Thymus enlargement
- Tuberculosis
- Renal
- Cardiac
- Bronchial infection, acute or chronic
- Reflex bronchial spasm

CLASSIFICATION OF RACKEMAN

- A. Pollen Hay Fever
 - Pollen Asthma
 - Complicated Pollen Asthma
- B. Dust, horse, feathers, etc.
 - Dust Asthma
 - Complicated Dust Asthma
- C. Food poisoning, urticaria, eczema
 - Food Asthma
 - Complicated Food Asthma
- D. Bronchitis
- E. Reflex
 - Perennial Asthma (bronchial infection without organic change)
 - Emphysema
 - Pulmonary Insufficiency
 - Chronic Bronchitis

The classification of Walker is the simpler of the three and quite satisfactory for practical purposes, but I would suggest that dusts be added to the group sensitive throughout the year. Cooke's classification is quite similar only somewhat differently arranged and superfluous, as most writers are agreed that true bronchial asthma bears no relationship to the dyspneas of cardiac and renal diseases. Rackemann's classification covers the subject very thoroughly and gives one an idea of what happens to the sensitive individual from the onset of his allergy to its termination.

Since often no amount of questioning reveals the cause or even gives a clue to the etiological factor producing the asthma, and since the removal of it gives immediate relief, there is justification for employing the protein skin tests, as they often-times, in fact, in the greater percentage of cases, demonstrate the exciting cause producing the symptoms.

The reaction that occurs when the protein is brought in contact with the scratch or injected into the skin of an individual sensitive to that particular protein, is an urticarial wheal, with irregular edges or pseudopodia, surrounded by an area of erythema. The two tests most frequently employed are the "scratch" and intradermal methods. The writer, after having observed and employed both methods, has concluded that the "scratch" method has given the most satisfactory results in his hands, although the intradermal method has proven equally as satisfactory in the hands of other workers, such as Cooke and Van der Veer. The reasons for employing the former method are similar to those quoted by other writers; that more tests can be made with less trouble and time at the same sitting; it is less painful and the possibilities of constitutional reaction are less than in the latter method; there is less danger of infection and does not require sterilization of solution; lastly, less frequency of false reactions.

The technic of the "scratch" or cutaneous method is as follows: A number of small cuts, each about 1-8-in. long are made on the flexor surface of the forearm. These cuts are made with a sharp scalpel, but not deep enough to draw blood **although** they do break the skin. **On each cut** is placed a small amount of protein, and to it is added a drop of N/10 sodium hydroxide to dissolve the protein and to permit of its rapid absorption. At the end of a half hour the proteins are washed off and the reactions noted, always comparing the inoculated cuts with the controls, on which no protein was placed.

A positive reaction consists of a raised white, irregular elevated, or urticarial wheal, surrounding the cut. A reaction to be positive must be at least 0.5 cm. in diameter. A negative reaction should rule out those proteins as causing the asthma or hay fever, while all those giving a positive reaction should be suspected as a cause of the allergic condition being studied.

The technic of the intradermal method is as follows: Sterile fluid preparation of the proteins are used, a tuberculin syringe, graduated in hundredths of a cc. with a 26 gauge needle being employed. About 0.01 cc. is drawn into the syringe and injected into the skin on the outer aspect of the upper arm, forming an elevation of about 2 to 3 m.m. in diameter. The results are noted in from 5 to 10 minutes and the reaction determined by the formation of a wheal, an area of erythema surrounding it. To be positive the wheal must be at least 0.5 cm. in diameter.

In performing skin tests it is well to bear in mind the following facts (1) That it is unwise to test patients immediately following or during attacks, as they will rarely respond to the tests, even though they are known to be sensitive, due to the passive immunity established by the attack. (2) Occasionally reactions occur with proteins with which the patient has never come in contact; this is a natural sensitiveness, and a warning to avoid contact with these proteins. (3) Reaction may be delayed, a test that appears negative after a half hour may become positive within 24 hours, this usually occurring in patients tested soon after an attack. (4) There is a group of cases that give a definite anaphylactic history but do not react to skin tests. This may be due to one of three reasons: (a) Possibly having omitted the proteins to which the patient is sensitive; (b) possibility of a toxin and not a protein being the cause; (c) possibility of having tested the patient during a period when he or she is recovering from an attack with the system loaded with antibodies, thus giving a negative test.

Cooke (6) has formulated two postulates which must be fulfilled before one can assume that any substance is etiologically important in a case of hypersensitiveness. They are as follows: (1) Hypersensitiveness must be demonstrated either by (a) a positive local reaction, cutaneous or ophthalmic, or (b) the original allergic manifestation must be artificially produced

at will, on introduction of the substance either by inhalation, ingestion, or subcutaneous injection. (2) It must be shown that the individual comes in contact, in some way, with the suspected substance in order to permit it to act as an etiological factor.

Patients may give clinical evidence of sensitization and give negative skin reaction, and positive reactions occur without clinical symptoms. The former may be explained by the fact that one having just recovered from an attack of asthma or other allergic condition has acquired a passive immunity. This also occurs at times after a patient has remained away from the protein to which he or she is sensitive to over a long period of time.

Multiple sensitization is not infrequent, and it has been the writer's experience that the earlier the age of onset of the allergic condition, the more liable is the individual to multiple sensitization. The writer has several patients who are sensitive to practically all groups of proteins, foods, pollens, epidermals, etc. The writer has found that multiple sensitization is more frequently found in adults than in children, and that the earlier one finds and eliminates the protein the less liable the individual is to multiple sensitization.

Brown (7) believes that undue reaction caused by the proteins of food may take place in any tissue or organ of the body, and the symptoms produced do not depend upon the variety of proteins but upon the tissue in which the manifestation takes place. The writer wishes to add to this that he believes that such reactions may occur from any protein, whether it comes from foods, epidermals or pollens.

The protein used, in testing, by the writer, are prepared by the method suggested by Coca, (14) having proven more satisfactory than those obtained from the various chemical houses, which were used up to a year ago. The proteins are in liquid form, and can be kept over a long period of

time. Their potency is determined by determining the nitrogen content by the Kjeldahl method, and then diluted to the strengths required for testing and treating, the usual strength of the testing solution being 0.5 mgm. per c.c.

The pollens are collected by the method originated by Hampton, (8) as follows: The flowering stalks of the grass to be collected are cut with a razor half way between the lowest flower on the stalk and base of the plant. They are to be placed immediately in a bucket of tap water and carried preferably to a greenhouse where the light and temperature are comparatively constant and free from air currents. Here they are transferred to quart fruit jars which should be placed on a clear piece of plate glass. About one dozen jars should be used and these are to be filled with a nutrient solution containing the chemical elements, hydrogen, oxygen, nitrogen, sulphur, phosphorus, iron, magnesia, calcium, potassium, as found in the following salts: potassium dihydrogen phosphate 8.574 g.; calcium nitrate 2.986 g.; magnesium sulphate 6.32 g.; ferric phosphate .001 g.; to each liter. Change the solution twice during the two weeks needed.

Each day the flowers should be quietly shaken and the pollen swept up with a camel's hair brush and sifted through bolting cloth. It is necessary to let the pollen dry for a couple of days to avoid spoiling, which happens if put in glass stoppered bottles too early.

In this way the large quantities of pollen can be collected with little effort or expense. This method is applicable to grasses or other shrubs, which do not produce pollen in large quantities.

The preparation of the pollen extract is as follows, according to the method outlined by Walker (9): To .5 gm. of the dry pollen is added 44 cc. of sterile normal saline and the mixture is shaken thoroughly at frequent intervals for 24 hours, after which enough absolute alcohol (6 cc.)

is added to the mixture to make the alcohol content 12%. Again the mixture is thoroughly shaken at frequent intervals for 24 hours, after which the mixture is centrifugalized at high speed and the supernatant fluid pipetted off and saved. This supernatant fluid therefore consists of the pollen protein dissolved in 12% alcoholic normal saline solution, and it represents by weight 1 part pollen to 100 parts solvent. This 1 to 100 solution is used as stock and from it other dilutions 1:500, 1:1,000, 10:5,000 and 1:10,000 are made. These solutions are used for skin tests and for treatment, and with the addition of a small crystal of thymol they keep for many months in a cool place.

When testing, it is advisable to test with the groups of various proteins, for example, Pollen Group, Food Group (which is further divided into the various types of food, such as cereals, meats, vegetables, nuts, fish, etc.), Epidermal Group (consisting of the various animal hairs and feathers), Bacterial Group, and the Miscellaneous Group (consisting of dust, sachet, face powders and drugs). The number of tests performed depend upon the history, but the writer thinks it advisable to use every available protein at hand, so as to avoid missing any to which one might be sensitive. At present there are available approximately 146 food proteins, 112 pollens, 9 animal hairs, 15 bacterial and the miscellaneous proteins obtained from the various sachets, face powders and drugs.

Treatment

It is not the intention of the writer at this time to discuss treatment of bronchial asthma during the acute attack, as this is so well known and standardized that it appears to be useless to dwell on this part of the subject. But will take up for your consideration specific treatment by means of desensitization with and elimination of the specific protein known to cause bronchial asthma, it being an accepted and well established procedure, yielding very satis-

factory results in the majority of cases.

In describing specific treatment the writer will discuss the various groups and their treatment as follows:

Food Group.

Pollen Group.

Epidermal Group.

Bacterial Group.

Miscellaneous Group.

Foods: It is the writer's practice with patients of this type to insist on a total and absolute abstinence from the foods to which they are sensitive, the period of abstinence being from a few years to permanency.

The patient is advised to report back at least once in six months, at which time the patient is retested with the foods to which he is sensitive and to any other proteins which he has not been tested with in the past. This is done for a two-fold purpose; it permits one to keep the patient under constant observation, and it is possible to determine whether or not the patient is acquiring an immunity by abstinence from the foods.

Some workers prefer artificial immunization with the foods to which the patient is sensitive. This method consists of giving gradually, ascending doses of protein, either by mouth or subcutaneously, over a long period of time, or until the patient is enabled to take large amounts of the protein to which he is sensitive. Some writers, such as Talbert (10) and Schloss (11) have reported some very brilliant results, but the writer, after having observed both methods in the various clinics in his own practice, has concluded that the results are far more satisfactory in the cases in which the foods are eliminated from the diet, than in those in which artificial immunization is attempted. The chief objections to the latter method are, (a) it is most difficult if not impossible to determine the accurate dosage; (b) the tissues cannot be depended upon to absorb the protein; (c) marked constitutional reactions may occur if the dose be larger than that which the patient can tolerate;

(d) the results obtained do not warrant the time spent in this attempt at immunization.

Pollen Type: This is best treated by artificial immunization with the proteins to which they are sensitive, and preferably preseasonal, thus producing an immunity to the offending protein of the pollen by the time active pollenization of the plant occurs. Treatment by this method should commence at least 14 weeks prior to the onset of the expected season, as the results obtained in the cases treated seasonally are not very satisfactory, due to the fact that it is impossible to determine an accurate dosage on account of the patient absorbing the pollens to which he is exposed, plus the amount administered subcutaneously. Walker states there are two chances of erring in the cases treated during the season, the liability of not giving enough pollen antigen to do any good, and the other, by far the more dangerous liability, of giving too large a dose. Not so much that the injected dose is too large as that the amount injected, together with the unknown amount which the patient is liable to encounter in the atmosphere may be too large, thus causing severe constitutional reaction.

After determining the pollens to which the patient is sensitive, the various dilutions are prepared. They are from 1- 100, to 1- 10,000. The patient is then tested to the various dilutions and treatment is commenced with the dilution next higher than the one which gives the least positive skin reaction. In other words, the initial dose consists of 0.1 cc. of the strongest dilution which failed to give reaction, no matter how slight it may be. Treatments are given subcutaneously at weekly intervals, never oftener than every five days. Each week the amount of antigen is gradually increased and as treatment progresses the strength of the dilutions is increased, until 1- 100 dilution is given. Below is an outline of the dosage for the treatment of this type:

1—10,000	0.1 cc, 0.2 cc
1— 5,000	0.2 cc, 0.3 cc, 0.4 cc
1— 1,000	0.2 cc, 0.3 cc
1— 500	0.2 cc, 0.3 cc, 0.4 cc
1— 100	0.1 cc, 0.2 cc, 0.3 cc, 0.4 cc

The above is the method employed by Walker (13) and proven very satisfactory in the hands of the writer and others. The writer's general rule during the treatment period relative to increasing the dosage is that should any of the following reactions occur—such as marked redness at the site of injection, hay fever or asthma occurring or immediately following within 24 hours of the time of treatment, then, instead of increasing the dosage at the next treatment, the dose of the previous treatment repeated. Any or all of the above mentioned reactions are very easily controlled by the use of epinephrin chloride, given subcutaneously in 5 to 15 minim doses, repeated as often as is necessary.

Epidermal Group: This group includes the animal hair danders, feathers and furs of various animals. Patients who are sensitive to feathers, such as goose, chicken and duck, are advised to avoid actual contact with them. This can be done by sleeping on hair or cotton floss pillows. But if the sensitization is the result of occupation, such as chicken ranchers, chicken killers and upholsterers, then it is advisable to immunize with the specific protein, as it is almost impossible to avoid contact. The above holds good for cases sensitive to cattle hair, dog hair, cat hair and other fur danders, but this rule does not hold good in individuals sensitive to horse dander, as its distribution is so widespread, being found on streets, in fertilizer on lawns, furniture, mattresses and even in clothes. The results in this particular group are unusually good, very few, if treated properly and consistently, fail to obtain relief, either entirely free over a long period of time (from 1 to 5 years, or more), or partial relief. The method of desensitization is similar to that employed in the pollen type, with the exception that those sensitive to the former are very much more sensitive,

some reacting to dilutions as high as 1-100,000.

The benefits of desensitization can be checked up by the skin tests. It will be noticed that as treatment progresses there will be a marked reduction in the positiveness of skin reaction. One must not treat this type too often, the interval between treatments must be at least 5 days, preferably at weekly intervals, as very marked and serious reactions may result, such as were mentioned in the discussion of pollen asthma.

Bacterial Type: In the individual sensitive to bacterial proteins and those having a secondary bacterial infection, the latter type commonly called "chronic bronchitis," and better called asthmatic bronchitis, are best treated with bacterial vaccine. In the former one should treat with a stock vaccine containing the organisms to which the patient was found sensitive, and better still, if the organism can be isolated from the sputum or nasal secretion an autogenous vaccine prepared and the patient treated with the same. The writer's method of preparing autogenous vaccine is similar to that employed by Walker (16), using the whole killed bacteria, the object being to desensitize the individual as well as immunizing him at the same time, thus protecting him from secondary infection.

In cases non-sensitive to bacterial proteins, an autogenous vaccine is prepared from the nasal or bronchial secretions in the following manner: A loop of the nasal secretion or sputum is placed in a tube of dextro bouillon and allowed to grow in the incubator for 36 hours, after which time it is centrifuged, the supernatant fluid decanted and washed with normal saline solution through three washings. It is then diluted so that each cc. contains 2000 million bacteria. The vaccine is then inactivated for one hour at 60 degrees centigrade and to it is added 5 minims of phenol, which acts as a preservative. In preparing this type of vaccine, no attempt is made to isolate the predom-

inating organism, all of the bacteria contained in the bouillon culture are utilized. But cultural studies on various media, particularly blood agar, are made for the identification of the organisms in the particular specimen.

Technic for the treatment is as follows: Initial dose consists of 200,000 bacteria or 0.1 cc., increasing a similar amount each week until 1. cc. is reached, at which time treatment is discontinued. And should any local or constitutional reactions occur, it is advisable to repeat the dose instead of increasing at the next treatment.

Miscellaneous Group: Face powders, sachets, tooth paste or powder, hypersensitiveness is best treated by avoidance of the powder or paste. If the powder be one containing orris root, and the patient is not sensitive to rice powder, or vice versa, then powders that do not contain the offending protein may be used. This type of individual gives very satisfactory results and obtains almost immediate relief by abstinence from the powder.

Drugs such as quinine and aspirin are the ones most frequently met with that give allergic reactions. They have been reported to cause asthma. The treatment of this type is simple avoidance of the drug in question.

Dusts: Room dusts obtained by sweeping or by the vacuum cleaner from the rooms or their contents occupied by patients are extracted by the method described by Coca, and the individual tested with the protein obtained. It has been shown by Cooke that about 4% of the asthmatics studied by him were sensitive to dusts with which they came in direct contact. The treatment indicated here is either desensitization with the specific dust protein, or change of environment.

CONCLUSIONS

1. That the hypersensitive state may be present at birth, inherited or conveyed by the mother to the child.
2. That a complete and thorough personal history, accompanied by a thorough physical examination, is of

prime importance in making the diagnosis and assists materially in determining the etiology.

3. A history of eczema, urticaria or hay fever bears a definite relationship to the protein sensitive asthmatic.

4. That bronchial asthma is no longer an incurable condition, since by scientific study with co-operation on the part of the patient and a persistency on the part of the physician, the greater percentage of sufferers can be permanently or partially relieved.

5. Multiple sensitization is common, sensitization to one protein in early life is apt to be followed by sensitization to other proteins in later life, and vice versa.

6. That the preparation of protein as suggested by Coca gives more satisfactory results than those purchased from commercial chemical firms.

7. It is necessary to have on hand all the proteins obtainable. The pollen proteins should be collected locally, as geographical regions of the United States differ, in the varieties of flora, and Eastern commercial pollens have no value in treating pollen sensitive asthmatics of the Southwest.

8. Complete abstinence from the foods to which one is sensitive is a much simpler and easier method of treating the food sensitive asthmatic than by artificial immunization.

9. Cultural studies of nasal, bronchial and other secretions are necessary to properly treat the bacterial type.

10. The pollen type is best treated by preseasonal treatments, but may be treated seasonally.

11. Of the epidermal type, those sensitive to horse dander should al-

ways be desensitized, while those sensitive to the other epidermal proteins, such as cat, dog, rabbit, are best treated by avoiding contact with the animal or fur to which they are sensitive.

12. The bacterial type, particularly the asthmatic bronchitis, is the most difficult to treat and gives the poorest results. They are best treated by autogenous vaccine.

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TREATMENT OF TRACHOMA.*

DR. J. D. MULDER, S. B., M. D., Reheboth, N. M.

Six years of medical work among the Navajo Indians gave me an excellent opportunity to study trachoma. Trachoma is common among them. In the camps the percentage runs above twenty. In different schools visited by Dr. Richards of Fort Defiance and the writer, this past fall, we found among five hundred and ten school children a prevalence of thirty-two per cent.

Our facilities for treating the disease and marking its progress, under and without treatment, could scarcely be surpassed. Many school children under our care six years ago are still with us today, and all school children at our post were entirely at our disposal for treatment. We further had the use of a thirty-bed hospital at which trachoma cases were treated free of charge and at which they could stay any length of time. Another factor in our favor was the character of the patient. The Navajo is phlegmatic. From his earliest days he is taught to suffer in silence.

We began the treatment of the disease with enthusiasm, expecting certain cures to result from the careful following up of various courses of treatment outlined by men of repute. The fact that the treatment would have to be continued for seven to eight months and in some cases years did not at all change our plans. We were determined to root out the disease, especially from among our school children. The first year I treated about forty school children, all of whom had definite active signs of trachoma. I treated them daily for eight months. First the eyes were all carefully rolled, mostly by men experienced in treating trachoma. Some twenty were rolled twice. Next they were treated with a four per cent solution of silver nitrate until most secretion subsided. This was

followed by an eight months' local application of copper sulphate stick and later the alum stick; reverting to silver nitrate if there was much secretion. At the end of this course, however, I could not see any gain and the next fall again going over all the pupils I found conditions very much like the previous year. The next year I picked out those with the most marked signs and symptoms, rolled those having the most follicles, following this with a six months' daily treatment of five per cent copper sulphate solution, alum stick, and silver nitrate as before. As results were very similar to that of the previous year, I discontinued the radical treatment. Of late, however, I have tried out for three months the course of treatment outlined by Dr. W. S. Benedict of the Mayo clinic, which consists mainly in the daily application of two per cent silver nitrate. As regards this last course, I have failed to recognize remarkable advantages over copper sulphate and alum stick treatment.

What happens in this radical treatment? There is a constant irritation of the conjunctiva, which even in a healthy condition, if so treated, would gradually become inflamed. A semi-active state results in the arrested or partially arrested cases, making danger of contagion greater, increasing the symptoms and thereby also the suffering. And why is the disease not cured? I personally think it is due to the fact that the organism is out of reach. Trachoma is a deep-seated disease. The organism likely finds a habitat not only in the adenoid stroma of the conjunctiva but also in the many glands, especially found in the tarsal cartilage. The fact that the cartilage so greatly thickens in old cases, strongly suggests this. Neither astringents, caustics, nor grattage, can reach the

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stroma or the inner surface of the tarsal glands. Caustics and astringents will cause a coagulation in the most superficial layers of cells making further penetration impossible. Grattage removes some outgrowths of the disease that cause mechanical symptoms but never touches the main abode of the organism.

It is easy for an enthusiast to ascribe my failure of cure to lack of tact and faulty technic. The fact, however, that the foremost ophthalmologists treating trachoma differ so radically as to methods is sufficient proof that a specific has not been found. Dr. John McMullen, surgeon U. S. P. H. S. in the J. A. M. A., Oct. 22, 1920, says, "Treatment of trachoma is surgical." He evidently had been discouraged in the use of local applications. Dr. W. L. Benedict, head of the section of ophthalmology, Mayo Clinic, writes: "I am getting farther and farther away from the operative methods for the treatment of trachoma," thereby almost placing a ban on surgery in the treatment.

My present treatment of trachoma (not mentioning prevention which I consider by far the most important) has in view arresting the disease. All school children who have no active symptoms are not treated. On the average no more than five to six per cent of those having signs of active trachoma will have symptoms. Those who do have symptoms are treated like the average active case, coming in from the reservation.

The treatment greatly depends upon symptoms, signs, complication, and sequellae present. In the average acute case, we first get the eye well cleaned. The eye is washed twice daily with a warm boric acid solution, after which yellow oxide of mercury is instilled. After two or three days of this treatment, the eye is anesthetized with a ten per cent solution of cocain. This is best directly applied to the everted conjunctiva. Three or four applications render them sufficiently anesthetized to roll the eyes of any Navajo thoroughly. . We then operate, using

aseptic precautions. After removing as many of the granulations by forceps as possible, we take gauze immersed in one to five hundred bichloride solution and once more go over the entire conjunctiva. We next instill some bland heavy oil, cover the eyes with a towel and put the patient to bed for a day. From now on the eyes are washed once or twice a day with a warm solution of boric acid, after which I instill a bland salve (a mixture of vaseline, three parts; zinc oxide, one part; and boric acid solution enough to make a soft salve); placing this in a 5 cc. syringe, makes an ideal preparation easily instilled. This I use until all symptoms disappear. At least sixty per cent of cases will respond in from two to four weeks. If in about three weeks there is no let up of symptoms, I use silver nitrate two to four per cent for several days upon the theory that more local reaction may be of value, and again follow this up with mild treatment. If the tarsal cartilage is greatly thickened, removal may cause rapid improvement. Kuhnt quoted by Melville Black, J. A. M. A., Nov. 16, 1918, says: "The excision of the tarsus is the last word in the management of cicatricial trachoma." I removed some forty cartilages in cicatricial trachoma but found its value mainly marked where the cartilage causes mechanical trauma. In cases of persistent blepharospasm, it is well to try canthoplasty. This may give immediate relief. Other mechanical sequellae, as entropion, ectropion, etc., should be treated by their respective surgical procedures, and complications as panus and ulcers of the cornea, demand special attention. I used the x-ray on several advanced cases and although I thus far can report no beneficial results, I think a systematic raying of the disease at various stages may prove of value.

Even after all these factors have been carefully tried out, there remain a certain number of malignant cases that go to blindness no matter what course of treatment is followed. I have in mind a patient,

father of a family of which every member was badly infected. This patient I had under observation for almost six years. The first three years he was a constant sufferer. I do not remember meeting him a single time during those three years that he did not try to protect his eyes from the light. He was in our hospital for treatment at least three times; at Fort Defiance Episcopal Eye Hospital at least once. All our attempts at relief failed except that when at the hospital symptoms were less severe, due evidently, to cleanliness.

Are there no cases who have had active trachoma that become free from the disease? I believe that trachoma in its first stage is at times entirely arrested. Not due to any form of specific treatment but to an acquired immunity. It seems almost certain that a considerable number of individuals have a natural immunity against the disease, and judging from this it appears very probable that immunity can also be acquired. Going over the five hundred and ten school children last fall, we found nine per cent with an active conjunctivitis, often of a marked follicular type usually found on the nasal side of the conjunctiva, covering the upper tarsal cartilage. This must include, among other forms of conjunctivitis, the first stage of trachoma; and so many of this class recover almost entirely that I feel constrained to believe that among the cured are also cases of trachoma.

Whether trachoma, after reaching

the secondary stage, in which there is definite scar formation, is ever cured, meaning by cured that all symptoms and signs of active trachoma have ceased and flare-ups are no more liable to recur than in one never suffering from the disease, is a question I am unable to answer. I have become convinced, however, that recurrence in these cases is the rule and not the exception. At the time of the sand storms all the old trachoma cases will at one time or other show active symptoms and signs.

After six years of treating trachoma we have come to the following conclusions:

First. That the treatment of trachoma is mainly preventative; educating afflicted families and more care at the boarding schools will go far to stamp out the disease, as danger of contagion, except in the acute stage, appears small.

Second. That trachoma should be treated from the point of view of arresting the disease, because (a) no specific has been found; (b) constant use of strong astringents and caustics, as silver nitrate, copper sulphate, and alum, as also repeated grattage, will set up a conjunctivitis, making the disease more contagious and cause much unnecessary suffering.

Third. Mild treatment as described above, using surgery when indicated, is of positive benefit; can be carried out by the patient himself; and will not cause him to avoid treatment and advice.

OXYGEN AND LIGHT IN THEIR RELATION TO THE INCIDENCE AND DEVELOPMENT OF CANCER.*

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It is evident to all physicians that cancer should be studied from every possible angle. Facts obtained by studying it from one angle may thro

some light on other phases of it. A careful scrutiny of known facts may give some suggestion regarding treatment, etiology or the mechanism where-

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by the body resists malignancy. A study of the negative side of cancer may give us some valuable information. By this I mean why cancer is so unusual in certain epithelial tissues, and is so frequent and fatal in others. This difference in susceptibility and resistance is evidently due to the function and chemical composition of the tissues, and is undoubtedly also influenced by external biological and physical conditions. There are good reasons for these differences, and we should make every possible effort to discover them.

Facts may be fairly readily obtained, as a rule, such as those relating to anatomy, physiology, pathology, and the various phases of statistics. The incidence of cancer represents the combined factors of attack and defense, and statistics should help us out in this. Statistics do not always distinguish clearly enough between sarcoma and carcinoma, or between primary and secondary growths, and then again many cases are either recorded improperly or not at all. Many statistics relating to cancer are in terms of total malignancy, and not limited to carcinoma. They are made up from mortality tables, and one source of error will gradually increase, that is, they will not include cases that have been treated and cured by medical or surgical means.

lungs comprise about 1 per cent of all cancers; this includes the trachea and bronchi. Cancer of the prostate was formerly thought to be less than 1 per cent of the total, but recent improvements in diagnosis show it to be more frequent; statistics are open to revision. Cancer of the bladder is between 0.25 and 0.96 per cent of all cancers, and in the ureter it is rare, no statistics being given. Cancer of the penis comprises 1 to 3 per cent of all cancers in males.

Several points of interest may be noted from the above figures, and other statistics not quoted. In males about 62 per cent of cancers are found in the digestive tract below the mouth. In females, when we exclude the generative organs and breast, the percentage is about the same. There must be some factor or group of factors directly or indirectly related to the digestive processes that especially predispose to cancer.

When we add to this cancers which affect other internal structures of the body, we find that fully 90 per cent of all cancers are found in tissues that are not exposed to either light or air. The question naturally arises, Is this due to the antagonistic action of light and oxygen, or have

The following figures were compiled by Dr. F. L. Hoffman (1.) statistician of the Prudential Insurance Company of America:

	Total	Males	Females
Mortality for 1920 in the United States: Whites 85,883			
colored 4,117.....	90,000	37,116	52,884
Buccal cavity, organs and parts.....	3,339	2,775	564
Stomach and liver.....	34,293	17,317	16,976
Peritoneum, intestines and rectum.....	11,980	5,141	6,839
Female generative organs—whites 12,401			
colored 1,270.....	13,671		13,671
Breast	8,368	132	8,237
Skin	3,169	2,045	1,115
Other organs.....	15,188	9,706	5,483

Ewing gives the following statistics: Carcinoma and sarcoma of the larynx comprise 1 to 5 per cent of all malignant tumors. Carcinoma of the

they nothing to do with it, and are the true causes of cancer principally operating inside the body and not on more or less exposed surfaces?

We hear a great deal about chronic infections in their relation to the incidence of cancer. Do they really have the influence in originating cancer that many authorities believe, and do they explain the relative frequency of involvement in different organs? Here we must draw the distinction between bacterial parasitism without particular damage, and definite infection with tissue pathology.

Cancer is, in many instances, a sequel of chronic infection and mechanical irritation, but is not, as far as we know, invariably preceded by them. When we consider the vast number of chronic infections that occur after the age of 35 we must acknowledge that cancer results in a very small proportion of them. I do not wish to minimize the importance of observations connecting cancer with previously existing inflammatory conditions, but wish to emphasize the fact that cancer does not often result from such conditions when we consider the relative number of each. Chronic inflammation is mentioned only to show its frequency in the various epithelial structures and that there must be some strong inhibitory influences at work either in the tissues, or physical conditions operating at the site of the lesion, to prevent its conversion into cancer. The determining factor, which is the exciting cause of cancer, is wholly unknown at present.

The skin is swarming with bacteria, and those that do not definitely inhabit it as parasites constantly have access to it. It is constantly exposed to mechanical insults, and areas of injury and infection are very common, as are skin diseases. The skin is the largest epithelial structure of the body, yet cancer is not nearly as common on it as in some other organs. As a rule cancer of the skin grows more slowly than other cancers, is less malignant, ulcerates later, has a lower mortality, and is more easily and successfully treated. Many of them are apparently not dependent upon local chronic infection or mechanical irritation.

Frequently there will be patches of carcinoma, basal cell type (rodent ulcer when ulcerated), on the skin, especially of the head, which have no doubt existed as such for years, yet have remained entirely inactive. At times they will become slightly active, scale and itch, and become inactive again. Some of these patches keep this up indefinitely and never give any serious trouble. In these cases ulceration and metastasis are late. Such cases are latent, and seem to be held in abeyance by powerful inhibitory factors. Can this be due to the light and air, owing to their being on the surface of the body?

If oxygen, as represented by the air, has an inhibitory influence on the development of cancer, we would expect malignancy to be least frequent in structures constantly exposed to it. In the nose bacteria are very numerous, infections are common, yet cancer is rare. Cancer of the mouth is unusual except in the presence of long-standing marked infection and mechanical irritation, as from bad teeth and the use of tobacco. Malignancy in the larynx constitutes 1 to 5 per cent of malignant tumors, both carcinoma and sarcoma. Carcinoma of the trachea, bronchi and lungs constitutes not more than 1 per cent of all cancers. We would expect these low figures if oxygen had an inhibitory influence. Certainly chronic irritation is common in these structures. The rarity of carcinoma of the lungs in pulmonary tuberculosis is worthy of note. When cancer of the lungs does occur it is not in cases of active pulmonary tuberculosis.

The rarity of primary cancer in the epithelium of the air cells of the lungs is of particular interest. Secretion does not occur, but physiologically the lungs are more active than any gland in the body. We might add that chronic infection is more common there than in any gland in the body, except perhaps the tonsils, in which structure cancer is rare.

Does metastasis occur in the lungs from primary cancer elsewhere in the body in the same frequency as

cells are taken into the circulation? I mean here after the filtering process of the lymph glands has broken down, and free cells are contained in the lymph emptied into the venous system proximal to the heart and lungs. I believe not, although positive figures on this subject are not available. The lung parenchyma should retain some of the carcinoma cells that are detached and thrown into the circulation, in which case metastasis should invariably occur at the point of retention and grow as rapidly as elsewhere in the absence of some powerful local protecting factor. This is worth investigation.

The female genital organs and breast tissue, where cancer is so frequent, are not exposed to either light or air.

The favorable influence of light can only be inferred, but it is suggestive that the only successful medical treatment of cancer in people is by means of the radium and x-rays. The light given off by the quartz lamp is of value, but not nearly as much so as those just mentioned. Also the effects of the exposure of the skin to sunlight resemble those of exposure to radium and the x-rays. These are in many respects similar to sunlight. All are forms of energy, have velocity and wave-length, and are very likely very fine particles traveling at enormous speed. They all have the ability to penetrate various substances to varying degrees. The therapeutic value of sunlight has been demonstrated in some other conditions, and it is only a step further to suspect it for cancer.

If sunlight has any protective influence at all we would expect cancer to be least frequent as we ascend in altitude and with air as free as possible from obstructive matter, provided other factors were equal. To be of any value such observations would have to be general, and not limited to one region. It would be exceedingly difficult to get together a mass of data from all over the world, from which conclusions re-

garding one factor could be deduced with any degree of accuracy.

We know from statistics that cancer is common in this country, and is on the increase. I do not believe that cancer is anything like as frequent in our Southwest as it is in the East or South. This is only an impression, but is gained from some years of observation and experience in our region. This would be a fertile field for some southwestern pathologist to investigate.

The following figures are from the U. S. Census, (3) and are in terms of cancer deaths per 100,000 population:

Registration area in 1913, 78.9.

California	97.6
Colorado	50.7
Connecticut	85.1
Indiana	81.1
Kentucky	48.0
Maine	107.5
Maryland	82.9
Mass.	101.4
Mich.	81.5
Minnesota	75.1
Missouri	67.1
Montana	49.4
N. H.	104.4
N. J.	78.4
N. Y.	87.8
N. C.	47.9
Ohio	81.8
Penn.	72.2
R. I.	93.3
S. D.	30.5
Utah	52.1
Vermont	111.7
Washington	53.5
Wisconsin	78.8

The average for states in the registration area was 78.9. We note that in general the highest figures are for the states at low altitude, with the greatest rainfall and humidity. The lowest figures are for states at some elevation and in the arid belt. There are a number of local contributing factors that prevent accurate comparison, such as the age of individuals in new and old states, nationality, and the negroes of the South, who make such a large part of the population there and in whom cancer is less frequent than it is in the whites.

The greatest amount of light and heat reach the earth on an average

all the year round between latitudes 23 1/2 degrees north and 23 1/2 degrees south. If light affected the frequency of cancer we would expect it to be least frequent between these latitudes, and more frequent towards the poles from them. It is very easy to draw wrong conclusions from statistics, as so many and varied factors are involved, but the following figures, compiled by F. L. Hoffman (3) are submitted as of interest:

"MORTALITY FROM CANCER IN CITIES
ACCORDING TO LATITUDE, 1908-1912

No. of cities	Degrees of latitude	Deaths from cancer	Rate per 100,000 populat'n
35	60° N. 50° N.	119,374	105.7
48	50° N. 40° N.	121,216	92.4
24	40° N. 30° N.	37,451	78.1
7	30° N. 10° N.	5,696	42.3
4	10° N. 10° S.	1,056	40.9
7	10° S. 30° S.	3,040	37.7
5	30° S. 40° S.	11,048	89.8
130		298,881	

Average 91.0

The cancer death rate of Hammerfest, Norway, the northernmost city of the world (latitude 70° 40' N.) during 1906-1910 was 132.0 per 100,000 population, and 138.9 during 1911."

Most of the large cities are situated north of 30° N. The population of cities south of that latitude is relatively small.

Hoffman (3) gives the following opinion: "The table, therefore, would seem to warrant the important conclusion that cancer frequency is

to a limited extent determined by latitude, which, of course, more or less determines the climate and weather conditions; in other words, cancer is excessively common in the temperate zone, moderately common in the medium zone and relatively rare in the torrid or semi-torrid zone, which for the present purpose may be construed to include the belt between latitude 30° north and 30° south."

Astronomers tell us that about 35 per cent of the light that strikes the outer layer of air is absorbed before it reaches sea-level. This is done by the air, moisture and impurities. The higher in altitude we go the more intense is the light. Also in our Southwest the air is dryer than elsewhere, the rainfall is lower, and there are fewer clouds. The light we get is much more intense at sea-level. The various rays accompanying light from the sun are diminished about in the same proportion as is light.

There is not much use theorizing as to how oxygen and light might have this result; we are first especially interested in the fact as to whether or not they actually do it.

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DIETETIC TREATMENT OF DIARRHEA IN BABIES.*

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A diarrhea is a condition characterized by frequent evacuation of the bowels. I want to consider, briefly, the various types, since in a large percentage of the trouble with infants, the condition we are called to relieve is the diarrhea.

It is not surprising that there is a wide divergence of opinion as to the

typing of diarrheas; some claim that all diarrheas are infectious, while another group take the ground that they are all due to chemical action or interference of fats, sugars, salts, or proteids, with the processes of digestion.

It seems to me that we should recognize the good in the contention of

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both groups and consider diarrheas under two great heads: (a) Those due to intestinal indigestion, i. e., the ones where there is an improper balance of sugars, starches, proteids, fats or salts, with either an over or an under feeding, when the little patient cannot tolerate enough food to make him grow; and (b) the infectious diarrhea, i. e., fermentative diarrheas which, in their origin, however, are chemical as they arise from sugar or starch intoxication, and putrefactive or proteid diarrheas which arise from an intolerance to the amount of proteid being given. These also in the beginning are chemical, but the trouble is caused by the toxins generated by action of the organisms. The differentiation of fermentative from putrefactive is usually easy, the first being foamy and with sour odor, while the second has the foul odor of decomposition. The fermentation naturally occurs where starches and sugars have been used freely while the putrefactive type, where whole milk without starches or sugars have been the diet. From the other infectious types, dysentery, cholera infantum, and sugar intoxication, differentiation is usually easy, as these are the severe types.

The infant is very sick from the outset, temperature high (104 or more) and often goes from bad to worse regardless of treatment pursued. The stools in dysentery are bloody, in cholera infantum wholly mucous and serous. Myer and Leopold experimentally produced a sugar fever with milk sugar in which the predominant symptoms are diarrhea, slow sterterous breathing, fever, eyes glassy and sunken, muscular twitching, and mouth open. We need only to mention the diarrheas that are not the primary trouble but only a symptom or a by-product of some other condition, as typhoid fever, amebic dysentery, marasmus, tuberculosis, ulcer; intussusception, diarrhea from cathartics and mechanical diarrhea.

Only a few years ago the classical treatment of diarrhea was an initial dose of castor oil followed by one,

two or three days' starvation, on the theory that all diarrheas were infections and that any food given would serve as a culture medium for the invading organism. In some cases this proceeding is both proper and commendable, but there is no doubt that the further depletion of an already depleted system both by physic and by starvation has so weakened many a baby as to render recovery impossible, and these cases of diarrhea from intestinal indigestion can be controlled by three or four days' dietetic treatment and without the use of any medicine whatsoever.

The methods of treatment most admirably worked out by Dennett, I quote because I have used them and I have never had them fail me. The first and easiest plan to carry out is: 1. Stop all sugars. 2. Feed one-third milk and two-thirds water boiled together. 3. Avoid cathartics. This method is applicable in cases of intestinal indigestion from fats, sugars, starches, or proteins; in underfeeding accompanied by intestinal indigestion, in overfeeding accompanied by intestinal indigestion and in fermentative infections. The second method is to give barley gruel for from one to four days, then return to milk (one-third) and water (two-thirds) boiled without sugar; after three days repeat barley gruel if necessary. Indications are putrefactive diarrhea, overfeeding and diarrhea not controlled by the first method. Third method: Give a cathartic; follow this with 24 hours' starvation, giving only plain water; follow with starches or gruels. This method is applicable in infectious diarrhea of the milder type, dysentery, cholera infantum, sugar intoxications and mechanical diarrhea.

If time permitted I should like to report cases illustrating each of these methods and giving details, but as you are no doubt all familiar with these methods and their results, I will go more into detail as to the fourth and fifth methods.

The fourth method is protein milk, which is applicable to cases of intestinal indigestion and fermentative

diarrhea and dysentery. Fifth method: Malt soup; applicable to practically all recurrent diarrheas or diarrheas of long standing. This is the method that practically never fails and every summer since I began to use it, feel that this method has saved some lives for me.

Protein milk is prepared by adding either a junket tablet, a drachm of essence of pepsin or of liquid rennet to a quart of warm milk. This is allowed to stand till it thickens, when it must then be heated to steaming heat (160 deg. F.) to prevent curdling the buttermilk; the whey is then strained off and the curds are forced through a fine sieve about three times and then added to one pint of cold water; to this water and curds is added a pint of buttermilk and it is ready for use. However, if the infant has been accustomed to much sugar in his milk, it is well to add a saccharin tablet to each quart, as this will increase the promptness with which the baby takes to it. This mixture being practically free from sugar furnishes no comfort or pabulum for the fermentative bacteria and they die.

As soon as the baby begins to have formed stools the boiled milk and water should be begun and this food should not be used for more than ten days without the addition of some form of sugar. Finkelstein and others have added sugar and continued it indefinitely. Were we in every case able to get the intelligent cooperation of the mother in the preparation of protein milk would be the first method instead of the fourth, but it confuses many mothers and for that reason it is only used when the others fail.

A case of this kind, baby age 11 months, weight 15 pounds, poorly nourished, skin shows wrinkling due to loss of fluids, had diarrhea two weeks, stools 8-12 per day, green yellow, normal odor, much mucus, no curds, no vomiting, appetite poor, sleep restless, temperature 99. Had been given castor oil and barley gruel at outset. As this didn't relieve condition, was put on half and half boiled milk and water and the diar-

rhea still persisted. Protein milk was ordered, 6 oz. every three hours. Three days later weight 14 pounds 12 oz., a loss of 4 oz.; condition about the same, stools three in 24 hours, pasty, normal color, very little mucus, vomiting none, appetite ravenous, sleep good, temperature normal; treatment protein milk 8 oz. every three hours, four days later condition good, weight 15 pounds, a gain of 4 oz., hungry, sleep good and temperature normal; treatment milk 16 oz., water 32 oz., boil and make seven feedings 6 1-2 oz. every three hours, increasing milk 4 ounces daily, decreasing water like amount; later sugar to be added sufficient to meet baby's needs.

Were there no limits to the length of papers or to your patience, I should report other cases, but as I want to give some attention to the fifth method, I must pass on to it. The malt soup mixture is to my mind the method that succeeds when all others fail, and is prepared in this manner. Two solutions are made, a solution of cold milk and wheat flour and a solution of hot water and malt soup extract. Always using equal amounts of malt soup and flour, the milk and flour mixture is put on the stove and the malt soup and water poured into it and slowly brought to a boil, when it comes to an active boil it is ready for use.

This method is especially applicable to the baby with a low food tolerance, the type of a baby who develops a diarrhea and when put on boiled milk and water the stools soon become natural but before the food is increased enough to supply his caloric needs the diarrhea recurs. Such a case I desire to report.

G. K., 3 1-2 months old was an 8 months' baby, labor induced on account of eclampsia in the mother, birth weight 5 1-2 pounds, present weight 5 pounds, loss 8 oz., poorly nourished, eyes sunken, some vomiting, stools 6 or 8 per day, green and much mucus; had been fed proper milk water and dextri-maltose mixture; would seem to do well as long as the mixture was below his needs,

but when these were approached back came the diarrhea. I should have put the child on malt soup sooner, but this case occurred before I was as familiar with malt soup as I am at present, and it seemed such a task to make, which is the poorest excuse in the world, and I quote the case to illustrate my mistake in not using it earlier, for always remember this fact in treating babies, no task is too stupendous for an anxious mother. Treatment ordered; water 24., milk 8 oz., boil and put in seven bottles, one at hours of 6, 9, 12, 3, 6, 9 and 2 a. m.; increase milk 1 oz. and decrease water 1 oz. each day. Three days later, condition about same, no gain or loss in weight, two stools in 24 hours, no curds and very little mucus, pasty in consistency and no foul odor; treatment ordered, milk 12

oz., water 24 oz., malt soup 2 drachms, flour 2 drachms, put in seven bottles as before. Three days later baby contented, three stools per day, no mucus or curds, no nausea, no foul odor, had gained two ounces in weight, food ordered same as before, except that increased flour and malt soup, 1 tablespoonful of each. Three days later he had gained two ounces more and so, by gradually bringing up the strength of the food, we were able to make the baby make a constant gain until he became, at 8 months, a normal healthy baby. At that time his parents left town and I lost track of him.

The point I want to make and emphasize is this, that in treating little babies with diarrhea the less medicine we use the better for the patient.

PROSTATIC SURGERY AND SOME OF ITS PROBLEMS

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This paper is rather composite in nature and will only deal with chronic surgical conditions of the prostate, eliminating the surgical history, etiology and symptomatology.

When a patient comes to us asking for relief from a prostatic obstruction, two problems must be decided.

1. Can this patient be safely operated?

2. If so, when?

The first question is decided by a complete physical examination of the patient. Prostatic obstructions have long been recognized as a cause of urinary stasis. The history of its recognition and of the attempts to remedy the local consequences of its development, goes hand in hand with the gradual growth of our knowledge of anatomy and pathology of the prostate and the improved surgical technique now in vogue. The desperate need for relief in many cases has led the physician to the employment of crude and cruel means of overcoming the distressing symptoms of the obstruction by forced catheterization, bold tunnelling of the

prostate through the urethra, suprapubic puncture and perineal cystotomy in emergency cases. The cause and effect in these conditions can usually be clearly followed. The pathology presented in these cases are chiefly, first, fibroadenoma; second, interstitial hypertrophy, and third, carcinoma.

The second problem, by a study of the urine and the blood in order that we may decide with reasonable accuracy, a comprehensive knowledge of the pathology of the prostate and physiology of the kidney is necessary.

As the tumor develops it causes a mechanical obstruction at the bladder outlet, at the same time an alteration in the shape of the bladder so that it cannot properly empty itself and residual urine results. It is considered with the presence of 100 cc of urine continually in the bladder that the urine backs into the pelvis of the kidney, causing flattening of the pyramids and a broadening of the calyces. This must cause more or less marked distortion of the urinary tubules, causing the kidneys to react to the pressure by the elimination

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of large quantities of urine of low specific gravity. Just how long this pressure in the kidney can exist before the kidney function is modified we do not know, but where a large quantity of low specific gravity urine is found a change has occurred in the kidney. In some cases, however, a normal urine will continue to be secreted even though considerable amount of residual urine be present. If, however, we decide to drain the bladder of one of these patients we find just as in those passing low specific gravity urine, a fall in the blood pressure and if drainage is made continuous a large number of them will become uremic. We are then of the belief that changes have occurred in the tubules of these cases.

This brings us to another problem. The choice of operation. We, who do general surgery and those limiting themselves to genito urinary work with one exception (Dr. Hugh Young) have practically decided that the two stage supra pubic route is the operation of choice. One of the objections advanced to doing a supra pubic cystotomy preliminary to prostatectomy, establishing a continuous drainage, is that we cannot again refill the kidney pelvis and produce the abnormal state under which it has been functioning and the case develops uremia. This objection can be overcome by the use of a small cork or clamp in the catheter allowing the bladder to empty at intervals by removal of the cork or release of the clamp, in this way controlling the too sudden release of back pressure.

The main object of the first stage operation is to obtain a gradual diminution in the back urinary pressure which has interfered with the physiology of the kidney. The operation for removal of the prostate is not in itself serious. In all other cases we proceed immediately to the supra-pubic cystotomy as a primary procedure. This operation is always done under local anesthesia using novacain one half of one percent, with the usual pre-operative preparation to the patient and operative field. The technic is a painless, clean cut division of the tissues; a good exposure of the anterior surface

of the bladder avoiding the disturbance of the peri-vesicular structures; fixation of the bladder fundus by the passage of two sutures through the fundus of the bladder wall, one on either side of the intended bladder opening; bladder usually has been irrigated and left moderately filled with the solution which assists considerably in the procedure; introducing the curved LePezzar catheter into the bladder wound without leakage; careful suturing of wound, closing all dead spaces with through and through silk worm gut sutures. This insures practically a painless, shockless operation, makes it possible to get your patient up almost immediately if you desire, at the same time preparing him for the removal of the prostatic obstruction by relieving the kidneys of the back urinary pressure.

Following the supra pubic cystotomy the results are, in practically every case, a primary union of the wound; a dry wound, without any urinary leakage; convenience for control of back pressure of urine in cases of impending uremia by clamp on catheter and collection of urine for examination, which obviates any further urethral instrumentation. This operation is done without anesthesia or surgical shock.

When the proper time has arrived for the enucleation of the prostatic obstruction the patient is prepared as before, prostatectomy being done through the former incision under spinal anesthesia using $1\frac{1}{4}$ grs. apothecin dissolved in one c. c. distilled water. Boil for two minutes. Spinal puncture is made in the second lumbar interspace from side obliquely in the canal, in this way avoiding injury to the plexus of veins in the center and less injury to the cord. We have used this technic entirely during the past five years. Analgesia is complete in from two to five minutes and lasts positively one hour and, in some cases, for two hours. This procedure relieves the patient of the injurious effects of ether, both its primary dangers and its effects on the already weakened kidneys, making it possible to operate a certain number of cases not suitable for general anesthe-

sia. We have only found it necessary to enlarge the supra-pubic wound in cases where considerable interval has been used in getting the kidneys accustomed to the relief of back pressure. Enucleation is accompanied by the introduction of the index finger into the vesical portion of the urethra which slowly dilates and ruptures the mucous membrane and capsule producing a natural line of cleavage between the glandular masses and muscular fibers which can be followed around by a sweep of the finger avoiding injury to the internal sphincter and allowing the patient to gain earlier control of the bladder. In the fibrous or muscular hyperplasia this separation is more difficult. In cases of an elevation or median bar there is often indication for a V-shaped wedge to be removed. This above procedure is accomplished by the assistance of the elevation of the prostate with the fingers of the other hand within the rectum. The prostate with all foreign material and blood clots are then removed. With the fingers still remaining in the rectum for pressure the torn bits of bladder membrane are pressed into the prostatic pouch and held so by the use of the Pilcher bag which is a small pear shaped, soft, rubber bag to the apex of which is attached a rubber drainage tube about the size of a catheter through which the urine drains, another smaller tube being attached to the side of the fundus of the bag for the purpose of inflation to the size required to fill the prostatic pouch, the bag being introduced by a metal catheter passed through the urethra into the bladder on the tip of which is fastened the tube to be drawn through the urethra pulling the inflated bag into the prostatic pouch. The portion extending from the urethra is carried down along side of the leg with moderate pressure and fastened with adhesive strips. This insures sufficient, constant pressure and hemostasis. It is easily removed by defla-

tion of the bag and withdrawal through the supra-pubic wound. The bag is usually removed in from 24 to 48 hours. This we consider is the most useful, ingenious, and safe measure. We no longer use the gauze packing on account of its uncertainty, the large amount of material required, the sloughing of the wound, painful removal, disturbance of the healing surface and dangers of secondary hemorrhage. A patient can usually be let up in 24 to 48 hours depending on their condition. Common sense must be used as to this procedure rather than set rules.

The method and technic mentioned in this paper deal almost strictly with the treatment of adenomatous hypertrophies, glandular and muscular hyperplasias of the prostate, as our experience has not been sufficient to dwell to any extent on the carcinomatous varieties which comprise according to Fryer, about 13 to 14% in a study of 1276 cases of enlarged prostate. Young estimates the frequency from 15 to 25% which is considerably more frequent than any other reported in the literature. Have also confined my remarks to the transvesical method for removal; however, some prefer and claim best results by the perineal route, this being especially adaptable in the cancerous variety.

Regardless of the method used by any operator I believe the malignant types should be subjected to proper roentgen and radium therapy as an adjunct to the surgical procedure on account of the fact that in a considerable percentage of cases of prostatic cancer diagnosis is not made until hope of a radical surgical cure for operation has passed. In such cases the use of the x-ray and radium should be attempted as a means for relief rather than subjecting the patient to a radical surgical operation with results frequently disappointing.

PROTEIN DESENSITIZATION AND THE FOOD ADDITION METHOD IN ASTHMA

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A system of diet devised by me, suggestively entitled the "Food Addition Method" has been of such value in producing desensitization and in other ways, in a number of difficult cases and is so rational in view of the observations on which it is founded, that I present it to this Association for further trial and application.

The method should be serviceable in any condition which is due primarily or partially to food allergy.

The system consists, essentially, in limiting the diet of the affected individual to one, or but a few, articles of food for a short time—ten days to five weeks—after which other articles are added one at a time; the effect of each is studied and if any certain food is found to produce untoward results it is again eliminated from the diet for a time; after a liberal diet has been reached no one article of food suspicious of having caused trouble is to be included in the diet, in so far as practicable, oftener than twice a week; it is preferable that the execution of the system be in conjunction with the sensitization skin tests and that no article of food be allowed the individual so long as he gives thereto a reaction even suspiciously positive.

The advantages of the system are as follows: (1) it is a second test upon each food as a source of trouble; (2) the withdrawal from the diet of a food which has caused asthma for a period of ten days to five weeks apparently results in the desensitization of the person to that food; (3) resensitization to a food seems to be avoided if the food having been the cause of anaphylaxis is not eaten too frequently; (4) an excellent opportunity is afforded by the careful supervision of the diet to supply the patient a maximum of the type of food best adapted to his particular needs; (5) the patient is impressed that he is dealing with a system of diet which has definite designs

and purposes and if the proper results are to be obtained he must follow carefully the instructions, and this is valuable suggestive therapy.

Clinical observations should rank with laboratory experiments as a basis for deductions and conclusions. The experimenter plans his experiment and executes it precisely with all influencing factors controlled according to the plan. The clinical observer has the stage all set and players ready for action before he appears upon the scene; it is his duty to make note of all elements participating and concerned in the final production. When a careful analysis has been made of all factors concerned in the production of a clinical result, the clinical observation in reality becomes an experiment and should be so utilized in the drawing of inferences.

The series of observations upon which the "Food Addition Method" was founded, or developed from, is as follows:

OBSERVATIONS

(1) I have observed repeatedly that individuals who react to the skin tests for the foods react frequently to a large number of foods and that also it is often difficult to know whether certain tests should be called negative or positive; not infrequently a test that is negative or only doubtfully positive at the end of an hour will be found to be positive after twenty-four to seventy-two hours.

(2) I have had a number of cases of asthma in whom food allergy seemed to be a paramount factor in the etiology of the asthma and yet when all the foods, which gave definitely positive reactions, were eliminated the hoped for improvement in the asthma was not obtained.

(3) An asthmatic, whose protein tests on the skin were all definitely neg-

ative, except three or four which at most were doubtfully positive, among which was lettuce, observed after this reaction was obtained that eating lettuce aggravated her asthma. A peculiar feature of the lettuce tests was that while on one occasion it was doubtful at the end of an hour, on another occasion it was definitely negative at the end of an hour and was doubtfully positive at the end of twenty-four hours.

(4) A man came to me a year ago with an extremely severe case of eczema, involving his entire body, which I later proved to be due to food allergy; he gave a history of having had asthma. When he had asthma, however, he did not have eczema, and when he had eczema he did not have asthma, at least to any extent. Similar observations have been recorded in the literature.

(5) An asthmatic who came to Arizona from Michigan suffered unduly from asthma in Arizona; among other causative factors for her asthma was her sensitization to orange and she had found the Salt River Valley oranges particularly palatable and was eating a great many of them. The oranges were eliminated from her diet and grapefruit, to which she did not react, were substituted. Her asthma was greatly benefited; but after six to eight weeks it gradually grew worse and soon had attained its former severity. Retesting her to the foods at that time it was found that she was then reacting to grapefruit and was *not* reacting to orange. Eliminating the grapefruit and adding the orange to her regular diet caused her grapefruit reaction to disappear and the orange reaction to reappear.

(6) Two men—father and son—whose asthma seemed to be due entirely to food allergy found, after abstaining some months from those articles of food to which the tests showed they were sensitized, that they could again eat them in small amounts, infrequently, without developing asthma; when they ate them frequently, however, their asthma developed.

(7) The patient referred to in Observation No. 4 was a baker, and

hence I suspected at once, on learning that fact, that wheat might be the cause of his eczema. I made twelve preliminary tests the first time that I saw him; among these were wheat, eggs, lettuce and carrots. The lettuce and carrots were the only ones which were unquestionably negative. He was allowed only lettuce and carrots to eat and his eczema disappeared rapidly—being nearly gone at the end of a week. Another patient who had an extremely severe eczema, involving the entire body, to such an extent that skin tests were impossible until improvement resulted, required five weeks for her eczema to clear up, on a diet the best that could be prescribed until the tests were made.

(8) The egg reaction, in the preliminary test in the patient referred to in 4 and 7 was marked; the wheat reaction was so slight that it was even regarded as doubtful. In subsequent tests, however, which were made at about weekly intervals, the egg reaction gradually decreased; and the wheat reaction gradually increased until it became a marked reaction at every test as long as the man remained under treatment; all the foods, save alone the wheat, to which he reacted at all, decreased in their reactions, and finally disappeared as did the egg. At the end of three months the man was able to eat everything but wheat. It is presumed that the wheat reaction disappeared also, at least at the end of six months.

(9) At the end of six months the patient began eating wheat, and of course ate it regularly, and after five months he again developed eczema. The condition was not so aggravated as it was when he was working in the bakery. For six weeks before I saw this man, however, he had been away from the bakery.

A woman with severe eczema, which seemed to be due primarily to peaches, recovered by abstaining for five weeks from all foods to which she was sensitized; peaches seemed to be the primary cause of her allergy. After five weeks she ate everything; on eating peaches several

times a week, however, she began to have pruritis and a tendency to eczema. This patient's husband had a slight eczema also, apparently from peaches, as I judged from the skin tests. After five weeks of abstaining from the positively reacting foods his eczema was gone. Eating peaches several times a week, however, also gave him a slight tendency to eczema. It is needless to say, however, that they both refrain from the too frequent eating of peaches.

(10) A man had extremely severe hives. He was given the skin tests and a diet was prescribed which contained only the decidedly negatively reacting foods. He was told to adhere to this diet for three weeks; but he broke over after about ten days of diet; he was apparently desensitized, however, by the ten days of restricted diet, as he had little or no trouble with hives after the ten days of restricted diet.

This patient had been under treatment for a year before I was making the protein skin tests, and all efforts, including a fairly thorough elimination of the suspected foods, were futile toward giving him relief.

(11) A friend of my family, who had been seriously troubled with hives for many years, met a physician in South America some years ago who advised her to include in her diet a liberal quantity of orange juice; for ten days he allowed her nothing but orange juice. She also eliminated from her diet certain meats, and other articles, which need not be mentioned here, but she continued using the liberal quantities of orange juice for years, and save for one slight temporary attack which yielded to starvation and orange juice, she has had no return of the hives for five or more years. She no longer pays special attention to her diet, but eats as fancy dictates, and has remained well.

(12) A second friend of my family, who has always been extremely thin, although apparently in good health, fell for the fad of drinking large quantities of milk. During a period of six weeks she took on

weight and her general physical condition seemed much improved. I have come in contact, especially in the past several years, with a number of the tuberculous who have done remarkably well by drinking four to five quarts of milk daily and taking no other food.

(13) The extremely fleshy have done most satisfactorily for me in the past several years on an exclusive diet of coarse vegetables.

(14) A certain asthmatic patient of mine visited another city two years ago and his asthma became so annoying that he called a physician; this physician arbitrarily advised him to exclude everything but milk from his diet. He did this and was greatly benefited—even beyond what I had been able to accomplish for him by a careful elimination of all foods to which the skin tests showed him sensitized.

Discussion of Observations

Observation No. 1 indicates that food allergy is extremely serious in many cases of asthma because of the large number of foods to which the asthmatic may be sensitized. In the event that a sufferer is allergic to but one or two foods it is a simple matter to eliminate the foods causing the trouble; but when twenty or more foods cause trouble the problem of eliminating the disturbers becomes most serious. The conclusion is obvious that all tests should be inspected at the end of 24 hours and even 48 and 72 hours, as reactions may be delayed.

This observation also indicates that there should be some way of marking the reactions which are not definitely positive. I have adopted a method of marking the reactions as follows: Where there is definitely no swelling or redness about the cut on which a protein is placed I credit the result as a double negative, thus=; a reaction which is plainly no more than the control is marked as a single negative, thus -; a reaction that is not enough more than the control to mark a one plus but is probably a shade more than the control is marked as a doubtfully positive, with both a plus and

minus sign, thus +; definite reactions — are marked with one, two, or three plus signs as indicated by the grade of reaction. The reactions are inspected again after 24 hours or more and the results are recorded as before.

From Observation No. 2 comes the deduction that a food or foods may cause trouble in the bronchi and may not cause a definitely positive skin reaction when the protein is applied to a cut in the skin. Observation No. 3 is to the effect that a food which gave no skin reaction or only a very slight one, and that sometimes only after 24 hours, when eaten has been found to aggravate the asthma of that person.

It has been recorded in the literature, and observation No. 4 reminded me thereof, that a person may be subject to asthma and to eczema from food, but that when he has one he rarely if ever has the other. From this comes the deduction that some tissues of the body may be subject to an allergic reaction while other tissues are not subject thereto. Therefore, the conclusion seems logical that in the asthmatic a food might cause asthma and yet not give a skin reaction.

Observation No. 5 gives two unusually important suggestions, namely, that abstaining from a food that causes an anaphylaxis may allow an individual to become desensitized thereto, and eating a food regularly and frequently may cause an individual to become sensitized to a food—at least resensitized to a food to which he had been desensitized. Observation No. 6 is corroborative of No. 5. It would seem from No. 5 that six weeks were sufficient to cause either desensitization or resensitization.

In Observation No. 7 an eczema cleared up promptly when only a limited diet of double negative foods were prescribed, whereas in another patient on whom no tests could be made and the diet prescribed was based on the history of what she rarely ate, the eczema was slow in

disappearing. It would seem to be important to base the diet on the skin tests; results may be obtained, however, without them.

Observation No. 8, in regard to the egg reaction, corroborates the previous observation that abstaining from a food, to which one has shown sensitization, causes a desensitization to that food. It is an interesting observation that the wheat reaction increased at least for a time after it was eliminated from the diet; just why the wheat reaction was negative, or nearly so, at first, when everything, and especially subsequent skin tests, pointed to it as being the primary producer of the anaphylaxis is not understood at present. From observation No. 8 one would conclude that three months was ample to desensitize to those foods which may be considered as secondary producers of allergy; and six months was ample to desensitize to a primary producer of the allergy. Also one may conclude from No. 9 that eating the primary producer of allergy frequently and regularly, as most of us eat wheat, for five months may resensitize to the food which was chiefly responsible for the anaphylaxis.

From Observation No. 10 we may conclude that one who has only hives from his food does not need to adhere to a restricted diet of the negative food as long as does the person with eczema or severe asthma.

Observation No. 11 was made earlier than the sequence of its reporting would indicate; at any rate, it was made at a time when I had drawn no definite conclusion about the production of either desensitization or resensitization. My first deduction from No. 11 was that a free administration of orange juice, to one suffering from anaphylaxis, might serve as a desensitizer to those foods causing the anaphylaxis. My first experiments in trying the orange juice as a desensitizer resulted in aggravating the condition of the patients on whom the experiment was tried. Although I was impressed at first by the theory of orange juice as a desensitizer, I realized later that the good obtained

by the patient in No. 11 might be due to the nearly permanent elimination from her diet of the several meats or other foods eliminated. If this were true, then one must conclude that after several years of abstaining from allergy producing foods, they may again be eaten and with impunity. After some of the other observations heretofore detailed had been made it occurred to me that likely the good that the individual concerned in Observation No. 11 obtained was due to the elimination for a time of all foods to which she was sensitized and allowing her to eat during this time a food to which she was not sensitized. The conclusion in this instance anyway is that ten days may have been sufficient to desensitize her to some foods; this conclusion must be held questionable, as she had eliminated certain few articles for a period of several years.

From Observation No. 12 we conclude that an individual may be safely and also advantageously limited for a time to one article of food if that article is milk. In the event that one is definitely not sensitized to milk and is sensitized to a number of other foods, some reactions of which may be questionable, and if the individual needs to take on weight, milk alone may be advantageously prescribed.

Observation No. 13 allows the conclusion that obese asthmatics may profitably limit their diets to coarse vegetables. It is obvious that if the obese asthmatic is not sensitized to the coarse vegetables prescribed and is sensitized to other foods the limiting of the diet to coarse vegetables should also do good by allowing a desensitization of the foods eliminated from the diet.

In Observation No. 14 there is an example of the asthmatic who was sensitized to some food or foods, the skin tests for which did not show positive reactions. He was not sensitized to milk; he was under weight. The diet limited to milk served a double function, first of desensitizing him to those foods to which he was

sensitized and, second, of putting flesh upon him.

Based upon my observations and upon the course of reasoning as presented in the preceding discussion I have evolved a system of diet for asthmatics and others in whom food allergy may be suspected.

The application of the "Food Addition Method" should be as follows: First, test the individual for anaphylactic reactions from a fairly complete list of foods, marking the results, double negative, negative, doubtfully positive, and positive in whatever grade indicated. The diet for the individual for the first period—ten days to five weeks—is selected from the foods which on the patient's chart have a double negative mark. If the individual is too thin, the highly nutritious foods in the list are chosen, whereas, if he is too fleshy the coarse vegetables from the list are selected; the patient is kept on this diet for ten days to five weeks or as long as is definitely indicated; whether five weeks is as long as any case will have to continue the diet of this period I have not definitely determined; at the end of the first period the single negative foods are added—selecting those suited to the particular needs of the patient—one at a time; after this list is utilized those in the doubtful class are added one at a time as before; any food that seems to produce untoward results is eliminated again for a time; it is always wise to make a skin test for such foods as apparently do harm, even if the first test of them indicated that they had no anaphylatic effect; when the doubtfully positive reacting foods have been added, in so far as is desirable, to the diet, all the foods which gave positive reactions should again be tested on the skin and the results recorded as before; the double negative, the negative, and the doubtfully positive foods are added to the diet as was done previously; then a retest is made of all foods which reacted on the last test and the same system as used before is followed in adding the foods to the diet; retests should be made whenever indicated.

Foods which at any test gave positive reactions should be included in the diet list each week on two days only and separated as far as possible; whether this precaution, of eating only twice a week, as far separated as possible, the foods which gave definitely positive anaphylactic reactions, is sufficient or not I have not definitely determined.

In conclusion, I would sound the warning that one must not be too enthusiastic about relieving asthma by eliminating all possibilities of anaphylactic reactions. The present-day tendency to classify asthma as one type of anaphylaxis—protein sensitization—is to be frowned upon; at the risk of being considered overly enthusiastic for my own theory, I would state that there is no one factor which is always and consistently present in all cases of asthma except the non-passive expiration and that the etiologic factors responsible for the non-passive expiration at the same time invariably produce disturbances—edema, inflammation, anaphylactic reaction, irritation, secretions and excretions—in the upper respiratory tract, and thereby bring on simple dyspnea, which is converted by the non-passive expiration into asthmatic dyspnea. If the physician will look upon asthma as a symptom of any and all pathologic conditions which may directly or indirectly affect the breathing and the upper respiratory tract and not be wedded to the view that all cases are due to anaphylaxis, or to the nose, or to bronchial muscle spasm, or to endocrine disturbances or to any other special theory, but that any and all of the abnormalities may be playing a certain part, greater advances should be made in the treatment of asthma. The strength of the non-passive expiration theory lies in the fact that it correlates and explains the various observations made, and the theories advanced, on asthma.

SUMMARY

1. Desensitization of a person to foods to which he has anaphylaxis may be accomplished, it seems, by eliminating those foods from the diet;

this seems definitely established for those articles which may be regarded as secondary reactors; it probably is also true for the primary reactors, though there may be a type of anaphylaxis which is not desensitized by a withdrawal of the article concerned for any length of time.

2. It seems that some individuals have been desensitized in as short a time as ten days, whereas, others require three to five weeks; others may require a much longer period.

3. Resensitization of a person to a food may take place by again frequently and regularly eating that food. In one instance this took place in six to eight weeks and in another in five months.

4. The resensitization may be avoided probably by the eating of the particular foods not oftener than once or possibly twice per week.

5. The resensitization question is especially serious when some food like wheat or potatoes or milk is at issue.

6. The skin tests should be inspected at the end of 24 hours, or even as late as 72 hours, as I have found tests to show no reaction at the end of an hour and yet show reactions at a later period.

7. It seems that anaphylactic sensitization is a local affair to a considerable extent, and for this reason the protein skin test should not be regarded as a final test for bronchial sensitization.

8. The "Food Addition Method" in diet, devised as a supplement, also as a complement, to the skin test, may detect foods which cause anaphylactic reactions and which may not give a positive skin test.

9. I have found it advantageous to use a system of recording the skin reactions as follows: A double minus sign for those that are definitely without swelling, and single negative sign for those that are plainly no more than the controls, a plus and minus sign for those that are doubtful and one, two or three pluses as indicated for those that definitely react.

10. The application of the "Food Addition Method" is in conjunction with the skin tests as interpreted by the system of marking as indicated above. No food is added so long as it gives a positive reaction. The individual is given, at first, a limited diet of non-reacting foods, and if no untoward results are observed, other non-reacting foods are gradually added. As the individual becomes desensitized to a food as shown by the skin test the food may be added to the diet list for irregular consumption.

11. An individual should not be permitted to eat oftener than twice a week any food to which he has previously reacted, and then only after he has ceased to react to it.

12. In the preliminary stage of the "Food Addition Method" when the diet is limited to one or but a few foods, the thin asthmatic is given milk, or other highly nutritious food to which he does not react, and the obese asthmatic is given coarse vegetables to which he does not react.

13. The "Food Addition Method" should be of service in a further study of the problems of anaphylaxis and desensitization.

ARIZONA NEWS ITEMS

DR. WM. A. SCHWARTZ, of Phoenix, spent the month of July in San Francisco, taking the post-graduate work which was given in a special class there by Fuchs, of Vienna.

DR. WILLARD SMITH, of Phoenix, after a month in the mountains of Arizona, left on August 1st for a six weeks' trip to Alaska.

It is rumored that DR. ALVIN T. KIRMSE, of Globe, will leave that city in the near future, and locate in El Paso. The Gila County Society will lose a very efficient secretary and the State Association will need to find a new treasurer, when Dr. Kirmse leaves.

DR. FRANK W. SCHWARTZ, past assistant surgeon in the United States Public Health Service, stationed at Whipple Barracks Hospital, has been appointed Superintendent of the Arizona State Hospital, in Phoenix. Dr. Schwartz is an experienced psychiatrist. Dr. Mildred Thoren remains as assistant superintendent.

DR. E. PAYNE PALMER, of Phoenix, left on July 31st, for a six weeks' trip into the Sierra Nevada Mountains of California, including the Yosemite Park.

DR. JAMES M. GREER, of Mesa, is spending a month in the White Mountains, going, as he announced, "where the foot of the white man has never before trod."

DR. CHAS. S. VIVIAN, of Phoenix, has just returned from a three weeks' vacation on the coast.

DR. ALEXANDER WALLACE, of Nogales, has moved to Los Angeles, where he is located in the Junior Orpheum Building.

DR. R. L. ALEXANDER, of Tempe, Arizona, has moved from the latter place and located in Ontario, California. Announcement cards state that Dr. Alexander will specialize in Diseases of Women and Children.

ABSTRACT

The Diagnosis of Pulmonary Tuberculosis. Louis Hamman, Baltimore, Md., Southern Medical Journal, July, 1922.

In spite of the persistent, vigorous and comprehensive campaign of education, during the past twenty years, the early stage of tuberculosis still eludes us. This is due to the indifference of patients in seeking advice in the early stage, the negligence of physicians, and the difficulty in reaching expertness in pulmonary examinations. The diagnosis of tuberculosis consists in a fine distinction between infection and disease. In considering the part that roentgenology plays in the diagnosis, we must not forget that the x-ray is only a part of the physical examination. There is nothing characteristic of tuberculosis about the physical signs in themselves, but the location of them is of considerable importance. One of the great advantages in the x-ray is the preservation of an accurate and permanent record of the lung density at the time of the exposure. The x-ray also reveals the pulmonary changes in greater detail. The x-ray may show surprising changes in a lung which revealed nothing abnormal to the physical examination. "If you discover slight abnormalities, the x-ray will show more extensive lesions." The great shortcoming of the physical examination is the difficulty of distinguishing between active and inactive lesions, and the same shortcoming adheres to the x-ray diagnosis. The detection of apical rales is the one feature in the physical examination where it has the advantage of the x-ray. The x-ray is indispensable to an accurate pulmonary diagnosis, but no physician should rely solely upon this for his diagnosis. The physician and roentgenologist should work in close co-operation.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

DR. KELVIN D. LYNCH, Mills Building, El Paso, Texas	Editor in Chief.
DR. PAUL GALLAGHER, Mills Building, El Paso, Texas.....	Associate Editor
DR. J. W. ELDER, Albuquerque, New Mexico.....	Associate Editor
DR. W. WARNER WATKINS, Box 1328, Phoenix, Arizona	Managing Editor

COUNTY MEDICAL SOCIETIES

The County Society is made or ruined by the Secretary. An efficient and active secretary can build up a lively and successful society, whether he deals with a half dozen doctors, or whether he works with one hundred. On the other hand, an inactive lackadaisical secretary can take the spirit and enthusiasm out of the county society and leave it flat on its back from inanition. We have both kinds of secretaries in Arizona and New Mexico. El Paso County Society has a secretary of the right sort, and he makes it a practice to do two things, in addition to many others:

(1) He secures and sends in for publication papers read before his Society.

(2) He keeps the medical profession informed as to the activities of his Society, sending in interesting accounts of the meetings of his Society and personal items about the doctors of his community.

Not one single county secretary of Arizona or New Mexico sends in any news items or any accounts of county medical society activities. Four county societies in New Mexico laid down and died during the last two years, and others are in precarious shape. Two societies in Arizona had not returned reports at the time of the annual meet-

ing and are entitled to an obituary notice.

It would tend to renewed activity and infuse new life into the societies if each one should place their secretary under bond and impose a fine of \$25.00 upon him if he failed to send in to the official journal a full account of their regular meetings.

Connect up your society with the official journal and, through it, let your state and the southwest know that you are in existence. Remember Mark Twain and let us know whether the "reports of your death are exaggerated."

THE GILA COUNTY PLAN

The plan of the Gila County Medical Society is to have an invited guest to address the society at its meeting on the first Monday of each month. Usually the evening begins with a dinner, after which the guest of the evening reads his paper, followed by an informal smoker. The plan, so far, has been a splendid success and assures a full attendance. Hotel and dinner expenses are paid by prorated assessment, collections being made at the dinner hour by a "hard-boiled" secretary. The travelling expenses are the personal pleasure of the invited speaker. When weather and other conditions permit, the essayist is enter-

tained by some individual member of the society on a fishing trip at Roosevelt Lake. Among the men who have helped make the plan successful during the past year were Dr. Albert Soiland, of Los Angeles; Dr. Willard Smith, of Phoenix; Drs. Hugh Crouse, K. D. Lynch and Willis Waite, of El Paso.

The program for the fall and winter will include able speakers from various parts of Arizona and bordering states.

Recently an auxiliary was formed by the wives of the Gila County physicians. This organization plans to meet at the homes of the various members on the evenings of the scheduled medical meetings. The purpose of this auxiliary, though chiefly social in nature, is to further the common interests of the physicians and organized medicine. They will study and discuss questions of medico-social nature and familiarize themselves with legislation affecting the practice of medicine. It is hoped that similar organizations will come into existence whose members, in their individual affiliation with other women's organizations, will, in time, have a pronounced influence in moulding the ideas of American women with regard to political, medical and economic questions.—A. T. K.

ARIZONA INDUSTRIAL CONGRESS

One of the noteworthy steps in the industrial and professional development of Arizona was the formation of the Industrial Congress, the avowed purpose of which is the "fostering of a spirit of co-operation between commercial, financial, manufacturing, trade, mining, livestock, and agricultural interests, and civic and secular organizations of the state." The activity of the organization embraces six groups of industries—agriculture, business and financial, livestock, mining, professional, public utilities.

The Arizona State Medical Association, at its annual meeting, voted to affiliate with the Congress, thereby making each member of the Association a member, also, of the Congress. It is hoped that this affiliation will have a double effect; that it will cause

the medical men of the state to interest themselves in the industrial and business problems of the commonwealth and lend their counsel and aid toward the proper solution of these problems; also, that the industrial and business world may be brought to a proper realization of the problems and ideals of the medical profession, and lend their influence and assistance to us. There is opportunity for much benefit to come from this association, but it will not come without some effort and study on the part of the medical men.

NEW YORK MEDICAL JOURNAL AND MEDICAL RECORD

One of the noteworthy changes in the field of medical publications is the combination of the Medical Record (Wood Co.), with the New York Medical Journal. This fusion of two of the prominent medical publications has resulted in an exceedingly active journal, which is published semi-monthly.

The material which has been appearing in this journal, in its new form, maintains the high standard which formerly governed the scientific material in the separate journals.

SELECTED ABSTRACTS ON RADIO- THERAPY

Radium Therapy in Certain Benign and Malignant Conditions. By Drs. Wm. D. James, Hamlet, N. C. Southern Medicine and Surgery, July, 1922.

In the treatment of malignant conditions in the several cavities of the body which communicate with the surface, radium is of much greater assistance to the surgeon than the x-ray. Also on the skin surface, radium is usually preferable.

Of benign conditions, fibroids and fibromyomas of the uterus afford the most pleasing results, except in very large tumors or pedunculated tumors, which conditions are more amenable to surgery for obvious reasons. Four hundred milligram-hours in the uterine cavity for from four to seven treatments usually suffice for fibroid tumors.

Lupus vulgaris responds more readily to radium treatment than to any other procedure. Full strength radium plaques screened with one or two mm. of aluminum and three mm. of rubber should be used; the same applies to pigmented nevi. Moles should not be treated with radium unless they are being irritated, in which case they should be treated as cancerous.

In inoperable carcinoma of the breast and in recurrent carcinoma after radical operation, radium therapy is the preferable treatment. Heroic treatment over a long period of time is required. Pre-operative raying is also advised.

In inoperable carcinoma of the uterus, twenty-four cases have been treated; twelve cases have been discharged from treatment, to be kept under observation; four others are ready to be discharged.

Radium treatment in operable carcinoma of the cervix is a worthy rival of total hysterectomy; two such cases have been treated with clinical cure.

The Use of Radium in Bleeding from the Nonmalignant Uterus. By Russell T. Wall, M. D., Scranton, Pa., *Penna. Med. Jour.*, July, 1922.

There are two classes, one caused by fibroids, and the other hemorrhagic endometritis.

In fibroids, the indications for surgery in preference to radium are (1) large tumors; (2) young women where sterilizing is not desired; (3) complicating pregnancy; (4) complicating infection; (5) Toxic conditions indicating absorption of necrotic fibroids; (6) where diagnosis of fibroid is not certain; (7) associated surgical conditions.

The advantages of radium are, certainty of stopping bleeding at once, no fatalities and no irritating symptoms if precautions are observed, ease of application, no anesthesia, can be given at home if necessary.

In essential bleeding or hemorrhagic endometritis, the effect of radium is prompt and certain. A curettage for diagnosis is essential, as there is always a suspicion of malignancy. Sixteen case histories are given.

Thyroid Therapy. R. G. Allison, M. D., Minneapolis, Minn. *Minnesota Medicine*, July, 1922.

This paper reports results obtained on the material coming under the observation of the Medical Service of the University Hospital during a period of about 20 months. This consisted of 27 cases of Graves' disease who were not operated, but treated with x-ray. Of these, 24 are well from the clinical and laboratory standpoints, after eight months.

All cases were treated with a standard dosage at three-week intervals, consisting of 30 mam. through 4 m.m. of Al and one thickness of leather, at an average distance of 8 inches and a gap of 8 inches between bluntpoints; three portals of entry, one over each lobe and one over the thymus. If improvement was not marked after the fourth treatment, the time was increased to 34 mam.

The closest co-operation between the internist and the roentgenologist is insisted upon, so that the clinical observations and metabolic determinations are carefully watched.

Radium Therapy of Cancer of the Mouth and Throat. By C. Everett Field, New York

City. *New York State Journal of Medicine*, March, 1922.

The author discusses the treatment of these very difficult cases, and insists that coagulation necrosis is frequently a necessary adjunct to radium in the mouth and throat. In carcinoma of the jaws, buccal cavity and larynx, radium has a limited advantage and permanent results are seldom secured.

For preoperative effect on neck glands to prevent metastases, about 3000 mgh. are required, filtered through 1.5 m.m. of brass at 2 c.m. distance.

In lip epithelioma, from 50 to 200 mgh. through $\frac{1}{2}$ to 1 m.m. of metal and 2 to 4 m.m. of rubber; where nodular masses are present, needles of radium element, 30 mgh. per c.c. of tissue is effective. In tumors of epiglottitis or larynx, 25 to 35 mgh. per c.c. of tissue by buried needles is advised, with cross fire of about 2000 mgh. from the outside.

This author does not believe that buried emanation is superior to needles.

Etiology, Pathology, Prognosis and Treatment of Acne. By Chas. H. Ball, Tulsa, Okla. *Jour. of the Okla. State Med. Assn.* June, 1922.

After outlining the general and local treatment for acne, both of which are essential, the author dwells at some length on the x-ray treatment. The rationale of this therapy depends the activity of the sebaceous glands can be diminished and exfoliation produced, thus sterilizing the skin. The amount of the x-ray will depend on the type of acne, the successful treatment depending upon a flexible technic which will adapt the dosage to the needs of each case. Acne requires more experience and judgment to produce results than any skin disease treated by x-rays.

Observations on the Use of Copper Filter in the Roentgen Treatment of Deep-Seated Malignancies. By Drs. Groover, Christie and Merritt, Washington, D. C. *Sou. Med. Jour.*, June, 1922.

A distinct advance in treating superficial malignancies was the substitution of the single massive dose for repeated fractional doses. For several years efforts have been directed toward securing a similar effect on deep-seated malignancies, by cross-firing, and increasing voltage and filters. The reports of work done abroad with higher voltages, increase in the skin-focus distance, substitution of heavier metals for the usual aluminum filter, reduction in the portals of entry and great increase in the time of exposure, have been very interesting. An attempt has been made to approximate that technic to the usual treatment machines in this country, using the following factors: Spark gap between bluntpoints, $8\frac{1}{2}$ and $9\frac{1}{2}$ inches; 5 milliamperes, .5 m.m. of copper and 1 m.m. of aluminum, skin-focus, 12 inches, time of exposure for each area, 3 hours.



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REX DUNCAN, M.D.

Medical Director

WE DESIRE TO CONFER and cooperate with the medical profession regarding the use of Radium in appropriate cases.

Number of areas treated have varied from one to four, not giving more than two hours treatment in any one day.

Roentgen sickness is usually severe, but perhaps no more so than with the usual treatment. On the skin the effect has varied from a bronzing to desquamation.

The technic has been used on 75 cases, practically all of them inoperable cancers. In general, the effect of the treatment has been more striking than they have ever observed before, large tumor masses disappearing, and the results of the treatment appear very encouraging.

BOOK REVIEWS

LESSONS ON TUBERCULOSIS AND CONSUMPTION: By Charles E. Atkinson, M. D., recently Medical Director of the Seymour Sanatorium for Diseases of the Throat and Lungs, Banning, California. Formerly member of the Resident Staff at the Pottenger Sanatorium for Diseases of the Throat and Lungs, Monrovia, California. Previously Attending Physician and Instructor in the Medical Clinic of the Graves Memorial Dispensary, Los Angeles Medical Department of the University of California; member of the National Tuberculosis Association; Fellow of the American Medical Association, etc. 470 pages.

Written for lay readers, this work is by far the most comprehensive and detailed in its subject matter of the several books of like character available. It would appear to answer almost every conceivable question in the mind of the tuberculosis patient. The style is clear, the statements conservative and not dogmatic. The book is unqualifiedly an excellent one and no consumptive will fail to profit by its careful and thorough study.—E. A. D.

PRACTICAL INFANT FEEDING: By Lewis Webb Hill, Junior Assistant Physician to the Childrens Hospital, Boston; Assistant in Pediatrics, Harvard Medical School. Octavo of 483 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1922. Cloth, \$5.00 net.

One of the most important subjects in the realm of medicine today is that of infant feeding. It has only been in the last few years that the subject has been put upon a practical scientific basis. The average general practitioner of today realizes the importance of the subject and is anxious for such literature as will aid him in protecting the future generation. Dr. Hill, through this volume on infant feeding has placed on the market a work that will be of great help to the general practitioner and a good reference book for the pediatricist. He discusses the subject of infant feeding in all of its various

angles from a sound, practical and scientific viewpoint. In the later chapters of the text the author has discussed very appropriately, the relationship of infant feeding to such subjects as rickets, scurvy, eczema, and others.

The subject matter of this text is presented in a simple and easily understandable manner and should aid the general practitioner greatly in those cases which are so discouraging and worrisome in his every-day practice.—V. S. R.

THE MANAGEMENT OF THE SICK INFANT: By Langley Porter, B. S., M. D., M. R. S. C., (Eng.) L. R. C. P. (Lond.), Professor of Clinical Pediatrics at the University of California Medical School; San Francisco Children's Hospital; Consulting Pediatrician Mary's Help Hospital, San Francisco; and by William E. Cramer, M. D., Assistant in Pediatrics and Chief of the Outpatient Department, University of California Medical School, Attending Physician, San Francisco Hospital. Octavo 654 pages, illustrated. First edition. C. V. Mosby Co., St. Louis, 1922. Cloth, \$7.50 net.

The title of this work is very descriptive and it is written for the practicing physician. Someone called this the book of "hows" and it was nicely expressed. In a similar manner the writers have kept in mind the patient who is so frequently forgotten in many of the modern scientific works. While the book may be easily classed as a high class manual of Pediatrics, the authors have carefully gleaned the salient points found in the modern literature that have a bearing on etiology, symptoms, diagnosis and therapy. They have also enriched the work from their wealth of clinical experience as applied especially to the management of the sick infant. It is a very gratifying experience to find a book which is thoroughly scientific and yet which does not forget the art of the practice of medicine. The suggestions for the care of the sick infant are pregnant with good sound advice and reflects the mature experience of careful clinical observers.

The book is divided into three main parts. the first dealing with symptoms in a condensed and thorough discussion; the second part deals with all the diseases of infancy, including the infections and the endocrine disorders; and the last part is devoted entirely to methods. Elaborate illustrations show the proper technic for the handling of babies where there are special problems of nursing, diagnosis or therapeutics. Detailed descriptions of the special procedures accompany the illustrations. Directions for the preparation of a great many formulae in feeding cases are well presented. Special suggestions for drugs and their administration occupy the last chapters. The book as a whole commends itself to those interested in the subject of pediatrics.—H. L.

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Official Organ of

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NEW MEXICO MEDICAL SOCIETY

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THE HISTORY OF THE DISEASES OF THE THYROID AND THE DEVELOPMENT OF ITS SURGERY.*

E. C. MOORE, M. D., 1005 Merchants National Bank Building, Los Angeles, California.

I greatly appreciate the invitation to address you, and the opportunity to meet the members of your Society has afforded me much pleasure.

In selecting a subject, the Thyroid is chosen, on account of its important position in the chain of ductless glands, and the frequency with which we meet its disorders.

Although we are familiar with the thyroid's structure, function, derangements of secretion and pathology, these will be referred to in reviewing that which laid the foundation for the scientific work in endocrinology today.

The search for the cause of things has existed since Man. Inability to explain reasonably, induced thinkers of ancient times to draw upon their imagination. In the early folk-lore of all races, we find the history of the origin of medical therapeutics. For every ill there was a remedy. The discovery of the earliest remedies was due to instinct, accident and experiment. When reading the medical therapy of early days, we assume they thought their remedies beneficial but did not know why. Numberless combinations were tried out and the most effectual prescribed. Health was believed to depend on accurate adjustment of Heat and Dryness, Coldness and Humidity,

along with other qualities; sickness was thought to be due to the predominance of one quality, and, to cure it, the missing quality must be determined and the balance restored. Queer ideas existed; the brain was regarded as the seat of the soul, and odors were believed to go through the nose to the brain. However, they were sure the brain was the center of intellectual activity and that an optic nerve existed. Their theories and facts are a peculiar blend of the remarkable and the ridiculous.

Early physiologists thought the thyroid had no special function, probably on account of its being ductless. Its purpose, according to their idea, was for rounding out the neck or influencing the voice; a reservoir for the blood, regulating the blood supply, or perhaps associated with sleep. Later, it was believed to be an external part of the digestive tract and so intimately related to the genital organs as to form an integral part.. In Southern Italy, it had been an early custom to measure the circumference of a woman's neck before and after marriage, an increase in size indicating she had conceived.

Although it would seem that the term. Goiter, came from "guttur," the Latin for throat, it was used by early writers for the enlargement of

* Address on Surgery, before the thirty-first annual meeting of the Arizona State Medical Association, at Prescott, Ariz., June 16, 1922.

any gland or organ if the deformity were visible. Later it was applied only to the thyroid, and today the term stands for hypertrophy of the gland. Up to the end of the eighteenth century the idea was held, that goiter (or bronchocele) was due to a hernia process, or air in the tissue of the thyroid. In 1810, Hausleuter proved it was in the gland itself.

Plinius, Vituw, and Ulpia spoke of Goiter as a "divine punishment." The same view probably existed in the middle ages, for, in the decoration of old churches, the Griffin and Devil are represented with goiter, as if it were a mark of depravity.

In the thirteenth century, Marco Polo mentioned its prevalence in the highlands of Central Asia, associating it with mountains, soils and water charged with certain chemicals. Other causes were cold air, air with too much electricity, too little oxygen and even too little Iodine.

In the fifteenth century, Paracelsus pointed out its connection with cretinism, in the Tyrol region.

The early Greeks prescribed ash of burned sea-sponges, not knowing it was rich in iodids. Not until 1820 was iodine used knowingly.

In an edition on Medicine, published by Good, in 1840, Goiter, or Derbyshire neck, is referred to; the latter name being given from the fact that so many people in the region of Derbyshire were afflicted with it. This they attributed to an indigestible, oaten cake, to which they traced all glandular enlargement. It was believed that the enlargement of any gland indicated that gland's weak action, as result of which the lymphatics absorbed only the more attenuate part of the fluids, leaving the grosser, which thickened and hardened in the parenchyma. Treatment consisted in first building up the patient by stimulants and tonics, long-continued friction with the hand over the tumor, together with application of ammoniacal irritants, chiefly spirits of camphor. Along with burnt sponge, hartshorn and burnt toads were applied. All were finally dis-

carded for the internal and external use of iodine.

In referring to operation for goiter, Good said: "It is the mischief to open one" and "patients often turn a deaf ear to any suggestion of the knife." "Removals were performed by Dresden, considered a "bold" operator, who attacked a goiter measuring 16 in. by 7 in., with appalling difficulties on account of the vascularity and complexity of the growth, and the impossibility of taking up many of the bleeding vessels." Some years prior to this Walther tied off the superior thyroid artery to cut off the blood supply, and, as early as 1804, Bruninghausen enucleated a cyst.

Much scientific investigation was done in 1856. Schiff proved that the thyroid is essential to life. He performed thyroidectomy on dogs which frequently died. He discovered that the absence of the gland caused spasms and that he could prevent these by the implantation of the gland under the skin or in the peritoneal cavity. However, there is record of Jong's noting convulsions following excision of the gland, in 1818. In subsequent experiments, Schiff removed only part of the gland, thereby obtaining better results. This marks the beginning of an immense amount of work by scientists.

Previous to work by Lebert, in 1862, pathologic research on the thyroid was confined principally to goiter. In these early experiments the parathyroids were not recognized. They were discovered in 1880 by Sandstrom, and not until 1896 was there any really accurate knowledge of their position.

After very elaborate experiments on dogs, in 1896, Edmunds published the following results:

(1) After complete excision of the thyroid and parathyroids, a great majority of dogs die within a few days and cannot be saved by thyroid feeding, but a small minority survive even after complete operation.

(2) In operations in which one or more parathyroids are left, the dogs, as a rule, survive.

(3) When only the thyriod is left, they usually die..

(4) With respect to operations which paralyze the secretory nerves of the thyroid, the dogs often die although possessing the whole of one thyroid lobe, together with the parathyroids of the same side.

Toward the end of the eighteenth century, when the old order of things began to topple, and scientific reform, like political, began to progress, the question of physiology was investigated. Physiological chemistry of digestion was inaugurated by Bernard, about 1855, and made thorough by Pavloff, whose work on the digestive glands is a classic. The brilliant results in the study of the endocrine glands of the past quarter of a century are the outcome of these initial experiments.

Then follow the discovery of the effect of adrenal extract by Oliver and Schaefer; iodine in the thyroid, by Baumann; thyroid diseases by Graves, Basedow and Slemon; investigation of parathyroid disease by Sandstrom, Gley and Halster, and others; and in 1873, Underland gave fresh gland of sheep in cases of goiter.

Magnus-Levy's studies on the influence of thyroxin in metabolism, in 1895, were a great advancement in medicine.

Basal metabolism is the total heat production, per hour, per sq. meter, of the body surface, with the subject at rest and in a post-absorptive condition. Boothby and Sanford confirmed that a hypo function of the thyriod lowers the metabolic rate and a hyper function raises it. By using Kendall's pure crystal thyroxin they have ascertained definitely the amount of thyrotoxin in the body, the amount normally in the gland, the amount necessary to bring a definite hypo thyroid to normal, and the amount used up daily by the body.

Let us turn to the gland itself. Included as a part of it are a number of parathyroid glandules (varying in number) and sometimes a portion of thyroid tissue lying between the base of the tongue and the aorta. The

pars intermedia of the pituitary body is believed by some to act as a substitute for the thyroid in case of its removal or atrophy.

It is one of the most vascular organs of the body, receiving more than 5 times as much blood as the kidneys, in proportion to its size.. Nearly as much blood passes through its arteries as through the internal carotid and vertebral to the brain. Its lymph system is very free. It varies in size and weight, according to age, sex, residence and the state of the individual's general nutrition. It is about one-third heavier in females than males, and relatively larger in infants than adults. The average adult gland weighs from 36 to 50 grams, in hilly districts, and 20 to 30 grams, at sea level. On the average, the right lobe is larger than the left. Some believe its function begins "in utero"; others, that it commences soon after birth. Its activity is greatest through the period of growth and lessens with the vital process. In the exercise of its function, it is associated with certain other hormone producing organs,—the generative, the liver, the pancreas, the supra renal capsule, the pituitary body and the thymus gland. So far as is known, it has four functions:

(1) It governs the growth of all cells and sustains their functional activity.

(2) Controls calcium metabolism.

(3) Is a profound katabolic stimulant, facilitating the breaking-down of exhausted cells and governing elimination of the waste products, showing their disintegration.

(4) It exercises a protective anti-toxic and immunizing action, defending the body, not only against the toxic products of its own metabolism, but against invasion by disease producing micro organisms and injury by their products.

It has been described as being to the human body what the draught is to the fire, and the iodine which it contains, by chemical interaction with constituents of the cells, as the match that kindles it.

Disorders of the gland may be due to nutritional, infectious or psychic causes, all of which may act together, the influence of one favoring the other.

The two deviations of the gland are hypothyroidism (under-activity) and hyperthyroidism, (over-activity). We associate hypothyroidism with myxedema, when the basal metabolism may be 50 or 60 below normal, accompanied by leather-like thickening of the skin, falling of the hair, mental dullness, sensitiveness to cold, obesity, constipation, marked slowing of the metabolic rate and mucus-like edema of the skin in pronounced cases. This type was described by Gull in 1873 as a cretinoid state. In 1883, Kocher called attention to the cachexia strumipriva.

In Graves' disease we find hyperthyroidism, with high basal metabolism rate, symptoms of persistent tachycardia, struma, fine tremor and often protrusion of the eyeballs. Its syndrome is most pronounced in what is known as typical exophthalmic goiter, where there is hypenpasia of the whole gland, giving rise to a horseshoe-shaped pulsating struma. The pulse rate runs from 100 to 150 or more, per minute. A less pronounced syndrome is met with in toxic goiter, thyroid adenomata, acute thyroiditis and in certain other conditions in which the activity of the gland is increased. A poison is produced which exerts a toxic effect upon the cardiovascular system, the nervous system and the tissues concerned in metabolism. In the treatment of hyperthyroidism, all possible toxic excitants are looked for, e. g., infection of the teeth, tonsils, gastrointestinal tract, gallbladder inflammation, pelvic disturbance, and a possible leucic infection. If the condition does not respond at once to medical treatment, it is dealt with surgically.

Reports as to the effect of roentgen ray and radium vary; aside from certain obvious factors, the effects of each are regarded identical. In my experience, I have no record of any dependable beneficial results from

radiation. Though this treatment may be simple, convenient to patient, and painless, the dosage is experimental. If the amount necessary to kill the cells is not given, relapse occurs; if a sufficient amount is given, hypo thyroidism or myxedema may result. And finally, when operation has been found necessary, scar tissue and adhesions are found to have been produced, making long, difficult dissection, and thereby increasing danger to the patient.

There should be no delay in referring patients who suffer from hyperthyroidism, in most cases, to surgery, as serious damage may result to the myocardium, liver and nervous system if delayed too long. Toxic symptoms are tachycardia and loss of strength; local signs of pressure or suspected adenomatous change; steady enlargement of the gland, with or without dyspnea, especially if the enlargement be downward and possibly substernal,—determined by radiologic examination.

Diseases of the thyroid have been placed under the following pathologic classifications (Crile):

Inflammation of the thyroid.

Tumors of the gland.

Simple goiter which includes the hyperplasias of the gland seen at puberty.

Colloid goiter.

Adenoma of the thyroid.

Exophthalmic goiter (hyperthyroidism).

Myxedema (hypothyroidism).

In addition to the two distinct clinical entities, namely, adenoma with hyperthyroidism and exophthalmic goiter, Plummer recognizes a small intermediate group. At operation the thyroid is found, by microscopic examination, to have, besides the adenoma, more or less typical areas of hypertrophy and hyperplasia of the parenchyma, varying between very small intra-adenomatous or extra-adenomatous areas to a small adenoma imbedded in a typical hypertrophic parenchymatous thyroid.

Goetsch recently described another condition which he has termed "dif-

fuse adenomatosis of the thyroid," the clinical symptoms being those of a very mild hyperthyroidism. He says that the new tissue characteristic develops from the interstitial cells. The striking difference from adenoma consists in the fact that instead of isolated islands of interstitial cells developing here and there in the gland, the entire interstitial element, otherwise known as the fetal cells of Cohnheim, simultaneously overgrows, thus causing the atrophy of the acinar or alveolar cells in the gland. This results in a very striking picture which is characterized by the structureless cellular overgrowth composed of a great number of interstitial cells, with an associated atrophy of the parenchyma. This picture is the precise opposite of the exophthalmic goiter, in which there is a tremendous hyperplasia of the acinar epithelium and an almost complete absence of the interstitial cells. The clinical symptoms which accompany this condition seem to be rather indefinite. The basal metabolism is said to be normal. We have not encountered the changes just described in any thyroids that we have examined, nor have we seen any cases clinically that would seem to fall into this group.

It must be remembered that in developing goiters, the vascularity increases, the iodine and colloid content diminishes, the follicles become larger and may vary in size and outline, and the epithelial cells increase in size and change from the cuboidal to nearer the columnar type. Such changes constitute simple hyperthyrophy. If the exciting factor continues to operate there occurs actual proliferation of the epithelium in the follicles, with the formation of new follicles, and, with this, infoldings, plications and papillary projections of the wall into the lumen of the follicles. When the changes have reached the point just described, there is a definite hyperplasia. If the exciting factor ceases to operate, after the gland has passed through the stages of hypertrophy and hyper-

plasia, there is a tendency for the gland to undergo involution toward recovery. When involution or recovery is complete, the gland becomes a colloid goiter.

The adenomas also pass through a series of changes, so that the microscopical appearance depends upon the stage of growth and differentiation, which they have attained at the time of examination.

From a microscopical study of the last 70 thyroid glands which have come under our observation and have been surgically removed, there were fifty (70%) which showed definite clinical symptoms of hyperthyroidism. An attempt was made, from microscopical study alone, to determine, first, the type of gland, and, second, the number of cases which probably had clinical symptoms of hyperthyroidism. In other words, whether we could tell by the gland if it were toxic. Of the 70 cases, 84% were correctly interpreted as to toxicity. Of the 11 misinterpreted cases, 6 had been diagnosed as probably not toxic microscopically but showed clinical symptoms of hyperthyroidism. Five cases were diagnosed microscopically as probably toxic but presented no clinical symptoms of hyperthyroidism.

It is unnecessary to go into the various methods of surgical treatment. We are familiar with the technique of ligation, resection, excision, enucleation, thyroidectomy, partial thyroidectomy, etc. The operations most frequently practised are probably ligation of one or two of the thyroid arteries and partial resection. We usually ligate if the disease is mild. In the severe cases, ligation is done preliminary to resection, not only as a step toward thyroidectomy but to test the patient's ability to stand an operation. A careful selection of the type of operation is made where the metabolic rate is above plus 40, and we hesitate doing a primary thyroidectomy when the reading is 60-70 above normal. If the case undergoes ligation with no untoward reaction, it is pretty good proof that thyroidectomy will be safe. Sometimes there is so much improvement

after ligation that further surgery seems unnecessary, but the general opinion is that ligation should be followed by thyroidectomy whenever possible, to avoid chance of recurrence. If ligation is followed by a mild reaction, thyroidectomy is performed in 7 or 8 days; if, by severe reaction, in 3 or 4 months.

In order to bring the metabolic rate to nearly normal in an exophthalmic goiter, we have found it necessary to remove all of one lobe, the isthmus and the greater portion of the other lobe, leaving a piece of gland tissue about one-half or one-third of a normal-sized lobe. We remove what we think necessary to relieve the patient and at the same time prevent symptoms of hypothyroidism.

The technic for the removal of the gland varies but little in different types of goiter, exophthalmic, colloid, adenoma or carcinoma.. In those types of substernal and intra-thoracic goiters, where the prolongation of the enlargement of the gland reaches behind the sternum or within the thoracic cavity, we may encounter simple, benign or malignant adenomas, either cystic or solid, and occasionally a diffuse colloid projection. In this class of goiters pressure has already interfered somewhat with breathing to such extent that the accessory muscles of inspiration have been brought into action. Under general anesthetic, the assistance of these muscles is lost, and respiratory movement becomes so difficult as to be impossible sometimes; therefore, a local anesthetic is often preferred. A low, transverse incision is made, through which all bleeding vessels are grasped and tied. The goiter is exposed by dividing the fascia in the midline between the two sternohyoids, and these muscles divided between clamps, including one part of the sternocleidomastoid if necessary. The trachea is next located. The superior pole is freed by dividing the superior thyroid vessels between double clamps and tying. Then the middle thyroid vein is tied, the isthmus divided and the lobe freed

from its attachment to the trachea. By pressing on the tumor in a forward and slightly downward direction the goiter is resected from above, downward, leaving the posterior capsule. As the inferior thyroid artery enters the gland near the middle of the lobe and remains partly in the neck in nearly all substernal goiters, its branches can be clamped and severed before the substernal projection is raised.

The mortality is low. Within the last few years, the mortality of thyroidectomy has been reduced so much that it is not considered greater than that of appendectomy. We have learned the value of operating before there are advanced cardiac symptoms, and if these are present, the patient is built up by rest, tonics and application of ice bags to the region of the heart, preliminary to the ordeal that is to be gone through. Psychic stimuli of worry and fear are guarded against; partially accomplished by not giving the actual time of operation, and on the day of surgery, only the familiar face of the nurse and anesthetist is seen. In the most supersensitive patients, to minimize the fear of the anesthesia inhalations of oxygen, and even a small amount of nitrous oxid., are given for several preceding days. This also gives the anesthetist an idea of the patient's reaction to anesthesia.

"The end to be achieved," states Crile, "is the maintenance of an unbroken state of negativity, while the exquisitely sensitized organism is carried through the processes of the ligation of an artery or the removal of a part of one or both lobes of the thyroid." "Along with the above protections, suboxidation should be guarded against, as a weak myocardium or a decompensated heart leads to serious suboxidation on account of a diminished blood supply. For this, digitalis is given, and repeated as may be required, until edema disappears and the tone of the heart is as good as its condition will permit."

The sudden withdrawal of thyroid activity is guarded against, and prevented by giving thyroid extract.

Postoperative hyperthyroidism is watched for, and with a rise of pulse, temperature and restlessness, morphine is given and ice bags applied, accordingly.

In advanced cases of exophthalmic goiter, there are frequently cycles of vomiting following operation, which we know to be particularly dangerous. Sufficient water controls this.

Crile believe that if the "bad risk" case is protected against the above conditions of suboxidation, want of water, pain, inhalation of anesthesia, absorption of wound secretions, infection, worry and fear, postoperative hyperthyroidism and hypothyroidism, the operability is 100%.

A complete cure depends upon the patient's cooperation, and the life led by the individual subsequent to surgery. It is just as important that the case be free from activity and excitation, care and worry, after operation as before. General and hygienic treatment is necessary until the patient is as well as possible, and, later, the occurrence of symptoms require careful examination, to discover and treat a relapse promptly.

So, as we look backward, and recognize the general advancement of our knowledge, the question arises: Is it possible to improve our methods of dealing with disease of the thyroid, and can we expect better surgical results than shown by Judd and Pemberton, who, after a study of 121 exophthalmic operations, concluded a cure may be expected in about 45%, a practical cure in 23%, some benefit in 4%, and no relief in only 5%?

As stated before, there are cases in which the pathologist's histologic picture does not appear to be consistent with the clinician's diagnosis, but we are of the opinion that even though the gland is pathologic, neither the pathology nor the symptomatology are constant. With the patient under observation, changes in the symptomatology may be noted, such being due in all probability to an altered physiological action of the hypertrophic cells without any demonstrable histologic change. Therefore, the logical conclusion would seem that a more accurate diagnosis of hyperthyroidism can be made from the clinical symptoms than the pathological study of the gland.

MEDICO LEGAL PROBLEMS IN ARIZONA.*

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The right to practice medicine in Arizona is like the right to practice any other profession, a valuable property right in which, under our constitution and laws, one is entitled to be protected and secured. On the other hand, the preservation of public health is one of the duties devolving on the State as the sovereign power and the discharge of this duty is accomplished by means of the exercise

of the inherent police power of the State.

Apparently here is presented a conflict between the right of the citizen to follow a profession and the right of the State to protect the health and welfare of its citizens. But this is not a very serious conflict because the outcome is very clear. Every person has a right to follow any lawful calling, subject,, however, always to such

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restrictions as the State may impose for the welfare and safety of society. This right is one of the distinguishing features of Republican institutions. Many of the occupations of life may be followed by persons irrespective of their fitness without danger to the public health or detriment to the general welfare. Others demand especial knowledge, training or experience and the power of the State to prescribe such restrictions and regulations for these, such as shall protect the general public from the consequences of ignorance, incapacity, deception and fraud is not now seriously questioned by anyone. This is particularly true with respect to the practice of medicine. Nearly everyone, during some period of his life, consults a physician but very few are able to judge of his qualifications and because of the importance of the interest committed to his care, it is perfectly clear that the State may interfere with the right of an individual and place restrictions and regulations on the practice of medicine.

At common law the medical profession was open to all without restriction but modern times have witnessed the universal passage of statutes requiring physicians to secure a license and providing a manner of ascertaining the applicant's fitness to practice his profession. This is true in practically every State of our Union and the relation of the physician to his patient is of such confidential and serious nature that not only the skill but also the moral character of the physician is of great importance to the interest of the patient and the State. It is very important that only men of good moral character should practice medicine and our State requires that an applicant must present a certificate of good moral character before the license will be given to him.

Moral character, under the rulings of our courts, means that the physician must not be a vicious or unprincipled man or a person destitute of moral sensibilities for the object sought is the protection of the home,

of the sick and distressed, from the intrusion therein, in a professional capacity, of such immoral men. Incidentally, I want to say that as a class and in comparison with other States, my investigation tells me that Arizona stands at the head of the list, yet even so, this standard can still be raised. All physicians should be men of the highest type and highest integrity because their opportunities for evil, if otherwise, are almost unlimited.

After Arizona has licensed its physicians, surgeons and other medical men, as permitted by our laws, such a license is not a contract and gives the holder no right to continue in the practice in the future, unrestricted. It therefore follows that under our laws, any license may be revoked for good cause and the revocation of such a license is not the taking of property without due process of law and naturally a license that should never have been granted in the first place, as for example, a license that was obtained by fraud, may be revoked at any time upon proof of the same..

Just as we may refuse to grant a license to a person of bad character, so may such a license be revoked when it is proven that the holder is immoral and of bad character.

The interest of the State of Arizona in the practice and character of physicians does not, by any means, cease with the granting of licenses. The State has the power to regulate the practice of the licensed practitioner in such a way as will operate for the welfare of the people. Just how far the State may go in regulating the personal conduct of the physicians has not yet been definitely determined. It seems clear that it may not interfere simply to preserve the professional standard of ethics set by the most prominent and successful physicians but it is equally clear that such conduct as affects the safety and welfare of the people may be regulated. It is true that a license may also be revoked because of unprofessional conduct or conduct dishonorable. Unprofessional conduct, as used in our law, does not

mean merely unethical conduct as judged by the higher standards of the profession but is generally held to mean dishonorable conduct.

Before we can reach a complete understanding of the law relating to physicians and surgeons, there must be a preliminary understanding of the nature of the relation that the physician bears toward his patient from a legal standpoint. The foundation of the relation is laid on the theory that the physician is one experienced and skilled in those subjects about which the ordinary layman knows next to nothing and in which he has the most interest—subjects relating to his health and the health of his family. The ignorant and ailing layman ordinarily relies implicitly on the word of the physician and follows professional advice religiously. It is natural that such a relation should be carefully entered into and that the law should seek to protect the layman therein.

The physician may accept a patient and thereby incur the consequent duties although his services were performed with the understanding that they were to be gratuitous or were performed at the solicitation and upon the guarantee of a third person. The fact even that a third person sends a physician to examine a patient for the purpose of benefiting the third person only and the patient not at all may not affect the case for the patient always has a right to refuse treatment and when professional assistance is accepted, such acceptance creates the practitioner the physician of the patient and subjects him to the resultant liabilities. To this wise rule there is found one exception, namely, where the person is examined for insanity by a physician acting on behalf of the State, the physician is not held to so high a degree of care as he would owe to a patient but is excused from liability for negligence and is liable for acts done in bad faith only. It matters not that a patient has not the ability to make a legally binding contract because of his infirmity. He may engage a physician

and the latter must conduct himself as carefully as though he were acting under a binding contract. The relation of physician and patient exists between the person actually giving the treatment and the patient receiving it. The physicians and surgeons of a hospital, public or private, enter into the relation of physician and patient brought into the hospital as soon as he is brought therein. His relation is not created unless the patient consents to it and the physician who operates on a patient without obtaining his consent commits a battery for which he must answer in damages unless the case was one of emergency. This rule is also subject to the qualification that a patient who places himself in the care of a physician confers on the physician implied authority to perform all acts and operations reasonably necessary to the treatment of the case.

The treatment of the sick is a question of so much concern to the State that special rules of law are made to govern physicians and surgeons. When a physician has undertaken the care of a patient, the law will hold him to the exercise of an amount of skill common to his profession. Whenever a physician undertakes the care of a case, the law imposes upon him the obligation of due care. Furthermore, as the nature of the physician's calling necessitates the disclosing to him of certain private matters, it follows that it is the duty of the physician to preserve his patient's secrets and a physician is not permitted to testify concerning matters that he learned or that his patient disclosed to him in a professional capacity nor can a physician invade the privacy of the sick room itself by introducing therein a layman under the guise of a consulting physician.

The physician naturally is in a position of trust and confidence as regards the patient and his opportunities to influence the patient are unusual, hence all transactions between physician and patient are very closely scrutinized by the courts which must be assured of the fairness of all busi-

ness dealings which may take place between a physician and his patient during the course of treatment. A gift from a patient to a physician, although not bad per se, is always subject to the suspicion that exists whenever a gift is made to a person in confidential relation to the giver. Thus, on the physician is cast the burden of proving that the gift was made fairly and without undue influence. uæmwæp tæwæpæw æwæw of prææw æw physician and patient, the rule is the same and the physician has the burden of proving that the patient entered into it voluntarily and advisedly.

In view of the numberless personal injury cases in Arizona due to our industrial conditions, many questions arise as to whether the physician represents the company for whom he may be working and many questions have arisen as to whether the physician has deceived the patient and is, therefore, liable in damages. Thus, when the question arises whether the physician has deceived the patient, the physician is again placed under a handicap. He must talk to a patient very carefully and when he tells the patient that a cure will be effected, he is on dangerous ground for such talk is held to be misrepresentation of a fact which should have been known to the physician and which makes him liable to damages in an action of deceit brought by the patient.

To enable the physician to treat his patient to advantage it is often necessary that the patient communicate information which it would be both embarrassing and harmful to have circulated generally throughout the community. Recognition of this fact has been given special attention in Arizona and a physician or a surgeon cannot disclose anything that he has learned or information that he has observed, without the patient's consent, and where a physician wrongfully divulges such information or communication, a cause of action arises in favor of the patient.

Naturally anything given on the

witness stand under the orders of the court would be protected by the law.

I want to call especial attention to the fact that it has never been the law in Arizona that the physician was under any obligation to undertake the treatment of every patient that applied to him. If a person holds himself out to the public as a physician and undertakes to treat a case, the law holds him to the standard of skill and care required but if the physician desires to escape the danger of liability, he may refuse to take the case. Naturally, however, the ethics of the profession require that the physician or surgeon give of his ability when requested and that he cannot capriciously refuse to treat a patient. The greatest problem that confronts the physicians and surgeons of Arizona is the malpractice problem. The welfare of the citizens of the State demands that those persons practising medicine and surgery shall be duly able and careful. And the law holds every physician or surgeon answerable for an injury to his patient resulting from want of the requisite knowledge and skill or the omission to use reasonable care and diligence or the failure to exercise his best judgment. This rule is elementary and has its foundation in public policy. Its purpose is to protect the health and lives of the public, particularly of the weak, ignorant or unwary from the unskillfulness or negligence of medical practitioners.

The duty of the physician is to exercise the requisite skill and care and such duty is not affected by the fact that the service rendered is gratuitous or by the fact that the physician was employed by a third person. The law holds that a contract exists in which the physician warrants to his patient that he possesses the requisite skill and will exercise the requisite care.

It is universally the law that a physician is liable to his patient for failure to exercise requisite skill and care but just what is meant by requisite skill and care is a question much more difficult to answer. The great weight of authority, however, established

the broad and flexible rule that a physician, in order to escape the danger of civil liability to the patient, must possess that reasonable degree of learning, skill and experience which ordinarily is possessed by others of his profession and that he must exercise reasonable and ordinary care and diligence in the exertion of his skill and the application of his knowledge and exert his best judgment as to treatment of the case entrusted to him.. In other words, the physician and surgeon is bound to bestow such reasonable and ordinary care, skill and diligence as physicians and surgeons in the same neighborhood and in the same general line of practice ordinarily have and exercise in like cases.

The terms "physician and surgeon" used by me are used interchangeably because the courts make no attempt, so far as this point is concerned, to distinguish between their respective liabilities.

The law exacts from physicians and surgeons while in the practice of their profession, only that they possess and exercise that reasonable degree of skill, knowledge and care ordinarily possessed and exercised by members of their profession in similar circumstances and does not exact from them the utmost degree of care and skill obtainable or known to the profession. Unless they contract to do more, they are held only to a reasonable amount of diligence and skill and are liable only for injuries resulting from neglect to exercise that degree of diligence and skill.

In an action for malpractice, a physician or surgeon is entitled to have his treatment of his patient tested by the rules and principles of the school of medicine to which he belongs. The rule which confines the inquiry as to the physician's skill and care to the rules and principles of the school of medicine to which he belongs, does not however, exclude the testimony of physicians of other schools or experts in other lines, when that testimony bears on a point as to which the principles of the school do,

or should concur, such as the damages incident to the use of x-ray, or the existence of a condition that should be recognized by any physician—that is, that a hip joint was dislocated, and not diseased. Further, this rule is limited by the qualification that the school must be a recognized school of good standing, one which has rules and principles of practice for the guidance of all of its members as respects diagnosis and remedies.

In determining the degree of care and skill which the law exacts of physicians and surgeons, regard must be had as to the state of advancement of the profession at the time of the treatment. They are held to exercise the ordinary care and skill of their profession in the light of modern learning on the subject.. Their treatment is measured by the standard existing at the time they are practising and not that which may have existed at some time in the past, and while it is his duty to keep up with the advancement made by his profession, also he must not attempt to force ahead of it by trying experiments on his regular patients. It is incumbent upon him to conform to the mode established by his school of practice for the treatment of a given case, and if he departs therefrom he does so at his peril, but the established mode of treatment does not necessarily mean a universal mode. A use of a mode known and approved by the profession, although not generally used, is an exercise of proper care. A physician may adopt new methods, if they are approved. This qualification of our law gives to you the opportunity to make progress after the experimental stage of a new method is past. The experiments in a mode of treatment should be tried on things or persons other than regular and unsuspecting patients,, and if an experiment is tried on a patient, it is at the financial risk of the physician, rather than of the patient.

The character of the locality, or neighborhood, in which a physician practices, has an important bearing on the requisite degree of skill and

care that is required of him. The physician is only required to bring to bear upon a case, such skill and care as are ordinarily practiced by others in a like situation and in like neighborhoods.

The rules governing the duty and liability of physicians and surgeons apply also to dentists, oculists and operators of x-ray machines. A physician who holds himself out as having special knowledge and skill in the treatment of a particular organ, or disease, is bound to bring to the discharge of his duties to patients employing him as a specialist, that degree of skill and learning ordinarily possessed by physicians who devote special attention and study to such organ, or disease, having regard to the present state of scientific knowledge. Being employed because of his peculiar learning and skill in the specialty practised by him, it follows that his duty to patients cannot be measured by the average skill of general practitioners.

Hospitals that treat patients, for hire, are liable for the negligence and malpractice of their physicians and nurses.

The Arizona law accords a physician the presumption that he has done his duty and in a suit for injuries caused by alleged malpractice, the burden is upon the plaintiff to prove the want of reasonable and ordinary care or skill. Damages may be recovered for all injuries resulting from the malpractice proven. Exemplary damages may be allowed for gross ignorance or negligence accompanied with evil intent.

I do not take up the question of compensation between physicians and surgeons because the law is practically the same as in other contract cases. That is to say, that where a person requests of another the performance of services, the law implies a promise to pay the reasonable value of the services performed. The amount of the compensation, the law fixes, in the absence of an express agreement, at the amount that they are reasonably worth. Professional

services are worth what they are rated at on the professional market. The physician has his services to sell. The patient agrees to buy them and pay for them the customary price. The financial condition of a patient cannot affect the value of the services rendered by a physician, although it might have a bearing on the existence of an agreement to pay a stipulated amount, yet if such an agreement cannot be proved as a fact, there would be implied a promise to pay for the services what they are reasonably worth, irrespective of the financial condition of the person sought to be held. However, in some states a different view obtains.

Medical defense to the members of your profession as against the suits for malpractice which may arise, is the big Medico-Legal problem of your profession in Arizona. Many malpractice cases arise out of spite, out of ignorance, out of jealousy of other physicians, out of careless remarks made by brother physicians, and out of the desire of some people, of a certain class, to secure something for nothing. The law, briefly, as to your rights and liabilities, has been spoken of before. These rules are based upon the fact that physicians and surgeons do not deal with inanimate matter like a stone-mason, or carpenter, who can choose his materials and adjust them according to mathematical lines, but a physician has a suffering human being to treat, a nervous system to tranquilize, an excited will to regulate. He has not only to apply the known facts and theoretical knowledge of science, but he may have to contend with many powerful and hidden influences, such as want of vital force, habits of life, hereditary conditions and disease, the state of climate, or the mental state of his patient, may render the management of a surgical case difficult, doubtful and dangerous, and may have greater influence in the result than all the surgeons may be able to accomplish, even with the best skill and care. We know, therefore, that with the best of treatment, with the best of

luck, sometimes unfortunate results are secured. A physician is not a warrantor of cures, or an insurer that his treatment will result in a benefit. The white head-stones and monuments within the sacred precincts of God's acre, in each city and hamlet in Arizona, testify that man is mortal and the most effective efforts of the physicians and surgeons in the noblest profession in the world, are incapable of resisting the Conqueror of all. The very best results of science recognize this truth. The medical profession of late years has made wonderful advances in resisting the ravages of disease, but it has its limitations and it has not yet reached its highest ideals.. It is unfortunate for the profession that too much is expected from it. Confidence in the physician by the patient is essential, but the law does not require such unwavering faith in his powers as the superstitious savage gives to his Medicine Man, but rather a sensible and intelligent trust that accepts reasonable efforts and when these have been bestowed that is sufficient, "Because he criticizes God who quarrels with the imperfections of man." No presumption of the absence of proper skill and attention arises from the mere fact that the patient does not recover. God firbid that the law should apply a rule so unjust as that to the relations and responsibilities arising out of this noble and humane profession. Notwithstanding this, the physician is liable to have his acts misjudged, his motives suspected, and the truth colored, or distorted, even when there are no dishonest intentions on the part of his accusers, and from the very nature of his duty he is constantly liable to be called upon to perform the most critical operations in the presence of persons united by the ties of family, where he may be the only witness in his own behalf. It is therefore very apparent that some protection to its members should be given by the Medical Profession. Recognizing the need of such protection, the Arizona Medical Association in 1917 organized its Medical De-

fense Committee, and I had the honor to be selected as its General Attorney. In the five years since that time we have been called upon to defend ten cases for this Association. Briefly, these cases are as follows:

(1) McCarthy vs. Pamsetgaaf, filed in 1917, for \$42,230. Judgment for the defendant; appealed to Supreme Court, where judgment was sustained.

(2) Weiss vs. Smith, filed in 1918, for \$10,000. Judgment for the defendant; no appeal.

(3) Mears vs. Kaull, filed 1918, for \$20,000. Judgment for the defendant; no appeal.

(4) Black vs. Palmer, filed 1918, for \$20,000. Judgment for defendant; no appeal.

(5) Alexander vs. Nelson, filed in 1919, for \$25,000. Judgment for the defendant; no appeal.

(6) Shackelford vs. Nelson, filed in 1919, for \$25,000. Judgment for the defendant; no appeal.

(7) Borer vs. Tyndale, filed in 1920, for \$25,000. Judgment for the defendant; no appeal.

(8) Miramon vs. Kaull, filed in 1920, for \$25,000. Judgment for the defendant; no appeal.

(9) List vs. Wilkinson, filed in 1920, for \$28,150. Judgment for \$100,000. New trial granted on defendant's motion; appeal taken by the plaintiff, from this action of the lower court, and decision of lower court sustained by Supreme Court. New trial now pending

(10) Kennedy vs. Smelker, filed 1921, for \$100,000. Now pending.

The total amount sued for in this time is approximately \$350,000, but it is a remarkable fact that not one dollar has ever been recovered in any of these suits. However, this good luck cannot continue, because in all human probability some case will arise where circumstances will be such that the Gods of Chance will decide against us and a verdict will be rendered, which if to be borne alone would bury the physician, individually, under its financial weight. In one of these cases a judgment was

secured against one of the physicians, but fortunately we were able to secure a new trial after an appeal to the Supreme Court, and this case is now awaiting retrial. I also, during this time, was associated in the defense of a physician in Northern Arizona who carried insurance in the Medical Protective Company. He was sued for \$32,000.00. One of my associates tried the case and a judgment for \$26,000.00 was secured. Later, we secured a new trial, and upon the second trial judgment was secured for the defendant. The only other additional case which has come to our knowledge is one against Dr. Palmer in the defense of which we have not been associated, he having his period not know the result in this case. Possibly Dr. Harbridge can enlighten us.

In view of the small number of physicians in Arizona, twelve cases in five years seem to be quite a number, but if one or two successful verdicts are secured against physicians, then the number will quickly multiply.

I have also been impressed in some of these cases, with the fact that the doctors have not been working in harmony, and that a brother doctor may carelessly make a statement which will give to a layman the thought that he may have a just cause for a suit against his own physician. However, in the last year or two I think this has been, through the efforts of the officers of this Association, greatly changed. It is not my idea to have the physicians attempt to cover up or personal feelings toward a fellow practitioner, or to save him from the necessity of paying damages in a case where he has violated the law. Neither is it your view, because your rules require that a committee examine into the merits of the case before defense will be given, and it must be found that it is a just case. Physicians should not permit their personal feelings toward a fellow practitioner to cause them to say or do that which may result in malpractice suits. If several big verdicts should be secured, the tide would turn and

no physician will be safe and no physician can trust himself to take charge of a case for fear that if he be unsuccessful, no matter how careful he may be, he may subject himself to a malpractice suit.

Through an experience of twenty years in the defense of personal injury cases in industrial occupations, I have seen these cases multiply until it has become almost a statewide scandal, and I do not want to see such conditions arise in your profession. The medical fraternity must cooperate in these matters. They must first know that a brother is right and then defend him with their united strength.

I have been immensely impressed with the high standing of the physicians and surgeons which has been my pleasure, and the pleasure of my associates to meet, during the last six years, throughout the State of Arizona. I do not believe that there is anywhere a higher class of men, or a better class of physicians and surgeons, of better education, or higher ethical standards, than the physicians and surgeons of the State of Arizona. You must stand together, and one of your first essential things is to preserve your present high standing and to keep out of your Association any physician or surgeon who is not qualified or who does not maintain the highest ethical standards, because the Association cannot afford to defend or uphold the acts of one who has clearly violated the standards of your profession, or the rules of the law.

I want to leave with you these thoughts—the thought of a layman toward your profession. The first is, I believe, that you should work for a return to a closer personal relationship between patient and physician. The modern tendency is toward an impersonal relationship. There is a tendency to separate the physician from his patient. The patient's sympathy should personally be enlisted in favor of the physician, and the cold mechanical attitude that some physicians and surgeons assume toward their patients has a tendency to bring about malpractice suits, if the results

are unsatisfactory. Second, your fees should be charged according to the services rendered and not according to the ability of the patient to pay. Your profession is a wonderful one. Your services should be measured by the professional skill and ability to render them. Any other basis tends to degrade and disgrace the person who accepts such fees. It is true, in your profession as in mine, that most of the burden must fall upon those able to pay, yet to charge those who are able to pay prices beyond what the services are worth, is unfair, because it tends to take away the physician's confidence and faith in himself. There should be a standard, flexible though it must be, upon these matters. All other high-grade services nowadays are paid for according to their real value, irrespective of who the purchaser may be.

Another suggestion that I want to leave with you is the fact that physicians should not hire themselves, or lend themselves, as a witness to one side or the other in lawsuits, either as alienists in insanity hearings, or as experts in personal injury or other cases. They should require and should notify litigants that they are testifying in a case to tell the truth, the whole truth, and nothing but the truth, irrespective of which side it benefits or injures, and if possible you should bring about the enactment of a law which will compel physicians, when required as witnesses, to be called by the court, only, so that you will be under no obligations to either side. To see physicians representing one side or the other, as experts, conflicting in their statements, has a tendency to undermine the public confidence in physicians and to hold

the science of medicine as a farce, and is nauseating in the extreme to the ordinary fair-minded person and tends to degrade and disgrace the entire profession. In personal injury cases many physicians are employed by one side or the other. This should be obviated and they should be appointed, as a board, by the court, to examine the patient and be permitted to tell their observations, irrespective of which side it will benefit. If your Association as a whole acts upon this question, it can be secured from the legislature much more quickly than if it emanates from the legal profession.

All science is the result of a voyage of exploration, and the science of medicine can hardly be said to have yet reached the shore. Men must be guided, therefore, by what is probably true and are not responsible for their ignorance of the absolute truth which is not known. If you will resort to the acknowledged proper sources of information, if you sit at the feet of masters of high repute and do as they have taught you, you have done your duty and will not be made answerable for the evils that may result from errors in the instructions which you have received. Medical opinion varies from time to time. What is taught at one period may be discovered to be erroneous at others. He who acts according to the best-known authority is a skillful practitioner, although that authority might lead him, in some respects, wrong. He will then have done all that he can, all that is given man to do, and he may leave the result without self-reproach in the hands of a higher power.

THORACOPLASTY IN THE TREATMENT OF TUBERCULOSIS.*

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All sciences must pass through a period of befuddlement. In the first place some fellow is seized by the germ of an idea, and it is usually wrong. That is not a serious matter, for whether he is right or wrong some one is sure to take the opposite side of the argument and that gets others to observing and recording facts. This results in the accumulation of data from which the real truth eventually leaks out, usually by accident. In the end, the whole matter can, as a rule, be summed up in a sentence. The shorter the sentence the more probably it is true.

A short time ago Dr. Yount read a paper which is important. The message he gave us is that we who practise in the Southwest have a task which we dare not shirk. We have a vast amount of work in the alleviation of tuberculosis, and we cannot dodge it if we are to continue our work here. In his paper he made a plea that the tuberculous patient be treated as a human being and be allowed to have the same chance as a non-tuberculous patient when he happens to become the victim of some ailment other than tuberculosis and which is capable of relief by surgery. He proved, at least to those of us who have had to deal with the problem for a long time, that there is no reason why the benefits of surgery need be withheld from this large class of sufferers.

We know of the classical operations on certain tuberculous lesions such as joints and kidneys and fistulae. These operations have been done so long and so well that they have become more or less standardized and a part of general surgery. Surgeons the world over are doing these operations by the thousands and are usually doing their patients great good by them. But they are

doing the surgery of the scrap pile.. They are working with secondary infections and not attacking the disease in its initial stronghold. I may be a constitutional doubter, but when I hear of a tuberculous lesion of the genital tract or of bone being described as an initial lesion and the lungs reported as free from signs of tuberculosis, I cannot resist the temptation to think that the observer did not look closely enough.

Our knowledge of pulmonary tuberculosis is gradually emerging from the nebulous stage. A wonderful amount of confusing information has been gathered on the subject, and from it all we are beginning to realize a few fundamental truths. We have almost arrived at that point where it can be boiled down into a single sentence. I will try to state it in that form.

Any tuberculous lesion will get well if we can keep it free from motion long enough and keep the patient well fed.

Let us see how that rule applies to pulmonary tuberculosis and the various methods which are in common use to help in its treatment. It is so well accepted that I need not defend it in theory. It is in therapy that we have fallen short. We all know that the first thing to do with a patient who has pulmonary tuberculosis is to put him to bed and keep him there for an indefinite time. This is not because the bed has any virtue in itself, but because when he is in bed he requires less nourishment to support life and less oxygen to make that nourishment available for the use of the body. This makes it possible for him to breathe less often and less deeply and as a consequence he will have less motion in the diseased tissues. Air, which is relatively free from moisture and smoke and dust favors recovery because the necessary

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oxygen can be obtained from a lesser volume of air and that again favors lung rest. The more compressed or denser air in the lower altitudes furnishes a greater amount of oxygen in a given volume of air, and thus favors lung rest. Outdoor air is not re-breathed air and has not been robbed of any of its oxygen and thus enables the physiologic need to be satisfied with less motion of the lungs. When we have applied these facts to the patient he soon becomes less toxic and it is then easier to superfeed him. These things are enough to enable the majority of patients with pulmonary tuberculosis to get well if we use good sense and gain his intelligent and honest cooperation and avoid filling him up with drugs.

All the above applies to pulmonary tuberculosis pure and simple, but it is not enough for the consumptive. That is a word we do not hear much nowadays, but it is a good term and should be revived. In the consumptive we have more than tuberculosis. We have a mixed infection which is more destructive than simple tuberculosis. If these rules are applied long enough and aided by vaccines and heliotherapy, many consumptives will get well. Some of them will develop enough immunity to become useful people in one way, but great public dangers in another, for they go about the business of living and scattering infection about them as long as they live. They are the most prolific source of infection and the efforts to eradicate tuberculosis will probably not be successful until these carriers are segregated where they will not be able to infect others. Just how to do this has never been determined and is a problem which has nothing to do with the object of this paper.

The particular class of patients to which I wish to direct your attention, however, is one with which you are all are familiar. They are the chronic cases who never get well and yet take an interminable time in dying. These usually are or become unilateral cases with uncollapsible cavities.

There is probably no such thing as a strictly unilateral case. But there are many in which the process has become firmly arrested in one lung while destructive lesions have progressed in the other to such an extent that they seem incurable. They commonly have pleural adhesions which make the complete collapse of the bad lung impossible by artificial pneumothorax. Jacobeus has devised a very interesting operation for such cases. After the lung has been compressed as much as possible by gas, he makes two punctures into the pleural space. Through one he passes an endoscope and through the other a cautery by means of which, while guided by sight through the endoscope, he severs the adhesions so far as he can and thus gets a more complete collapse of the lung. These adhesions usually form in such a way as to hold uncompressed the very part of the lung which needs it most. They are prone to form over cavities and aid the dense walls of the cavities in resisting the compressive effect of the gas. The amount of pressure which may be exerted by the use of gas is strictly limited and often is not enough to secure the desired effect. Postural treatment helps a great deal, either when used alone or in combination with artificial pneumothorax. The use of shotbag pressure or the compressive force of specially devised braces also helps. My experience has taught me that very few of them can be made to apply these measures long enough to get results. This is sometimes because the patient develops a streak of temperament and there is a peculiar temperament which is characteristic of tuberculosis, or else he dies before the experiment is concluded. All good things have an end, and there is an end to the patience of the most obedient of patients. Rest is the thing that all of our efforts are designed to get, but there comes a time when the remainder of the body of the patient demands exercise or else it quits. A broken arm can be kept at rest by putting the whole patient to bed and

keeping him there until the arm has had time to heal. But the general health of the patient can be kept at a higher level if he is given a reasonable amount of exercise and the arm alone kept at rest by putting it in a splint. The same thing is true of advanced tuberculous patients. There eventually comes a time when, if the remainder of the body is deprived of its physiologic stimuli, it lies down on the job and the next event is a funeral.

At this point let us look again at the target. In this class of patients we do not hope for restoration of useful lung. We simply aim at the stopping of destruction and such disposal of the wreckage as will make it least obnoxious and less apt to again become the seat of active disease. One thing we know. It is that when a portion of lung becomes honeycombed by cavities it will remain the seat of disease until by some means it is compressed so completely that the cavities are obliterated and what were once active cavities are converted into planes of scar. The breathing function of that part of the lung is already gone. There is no hope of restoring that. The cases in which functional restoration is possible are capable of treatment successfully by artificial pneumothorax. They are not the cases about which I am talking. The great obstacle to complete compression is that the ribs are stiff and unyielding. Well, if the mountain will not come to Mohammed, Mohammed can go to the mountain. It is easily possible to remove as many of the ribs as may be necessary without penetrating the pleura and thus to mobilize the chest wall so that atmospheric pressure will convert what was a convex into a concave contour. Thus pressure will be brought to bear which will collapse a large number of these lungs. The collapse is permanent, but that is what is desired. It produces deformity, but clothing will cover that. The point is that it collapses the cavities and gives them a chance to heal because they are permanently com-

pressed and the nearby lung tissue is deprived of its function. The method of Sauerbruch is perhaps the best one yet devised for the purpose and can be done with a local anaesthetic if necessary, but with gas-oxygen anaesthesia by preference. The important thing to bear in mind in this method is not to do too much at one operation. Do not try to remove more than five ribs at one time. Four is a safer number. At a subsequent operation more ribs can be resected if needed, and so on until enough compression is secured. The operation is simple. One makes the incision in such a manner as to get best access to that section of the ribs which is to be resected, usually at a right angle to the line of the ribs so that all can be done from one incision. Each rib is resected for the requisite length subperiosteally. Then that side of the chest is forcibly compressed by hand and held in compression by broad bands of adhesive plaster passing two-thirds around the body. The adhesive plaster immobilizes the operative area and makes the after pain negligible. The shock is not great and is well endured by these patients. It is remarkable how well tuberculous patients stand operative procedures.

The method of Sauerbruch suffices for the cases in which the compression is desired in parts of the chest below the second rib. Above that it fails. Adhesions do not matter, for both layers of the pleura are carried in together. The pressure secured is sufficient to collapse the thickest walled cavities. The destroyed lung is converted into innocuous scar and the prime object has been attained.

In cases where the compression must be made at or above the level of the second rib, the method devised by Archbold is successful. In this method the first, second, third and fourth, and in some cases the fifth ribs, are resected in a manner similar to that used in the Sauerbruch. The pectoral muscles are detached from their insertion and reflected inward. Then the parietal pleura is carefully detached from the underlying muscu-

lature all over the apex of the chest. This must be done with the most extreme care for it is easy to puncture a solidly adherent pleura. When the apical portion of the lung with its attached and intact double layer of pleura is completely mobilized, this mass is pressed down and the pectoral muscles are transplanted to a position within the chest wall where it occupies the space formerly occupied by the lung. The transplanted muscles are then fixed in position by catgut stitches and the wound closed and treated as in a Sauerbruch.

There are many variations of technic with which it is well for the surgeon to be familiar before he begins one of these operations, for they will help him out of a tight place now and then. It is to be admitted that the Archbold procedure is real surgery and not to be attempted by the casual operator, but it is successful and solves the problem for these heretofore insuperable cases..

Let it be understood that I am not advising these methods in the usual

run of cases. They are heroic measures but they are for the salvage of those cases which without them have no hope. They are based on the old and certain principle of rest and are not to be used if that object can be attained by easier methods. No doctor has a right to deprive his patient of the chance which these operations afford if the simpler methods have proved ineffective.

Medical literature is overcrowded with case reports. Sometimes these are appended to articles for the purpose of making clear the subject matter. Sometimes they are appended for the purpose of impressing the reader with the acumen and skill of the writer. It is not my desire to make this paper unduly lengthy. The foregoing information is the result of considerable personal experience in the application of the measures advised and is an endeavor to condense into practical form the lessons I have learned in the course of a number of years of endeavor to reclaim a fairly large number of such cases.

SOME OBSERVATIONS FROM THE CLINICAL AND LABORATORY FINDINGS IN PYELITIS AND PYELONEPHRITIS.*

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Included among the many paradoxical findings in clinical investigation and laboratory examinations are those concerning infections of the kidney pelvis and their associated glandular structures. The subjective symptoms, clinical course and results of laboratory analyses run in no way

parallel either in mild or severe cases. As a gross example may be mentioned the bacteriuria of renal origin not associated with an infective disease, where practically pure cultures, usually of colon bacilli, are constantly poured from the kidney without a subjective symptom or any elevation

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of temperature. In these cases drainage of the bladder with a resident catheter suffices to clear the urine to limpid, but silent recurrence is the rule upon withdrawal of the drainage. It is not unknown to see in a single day the same patient with a swirling bacilluria and a perfectly clear urine.. An infection of this kind may persist for years, possibly without destructive process or interference with the general health.

However, more serious aspects and complications are encountered in cases of acute involvement, or acute exacerbations of chronic and latent infections usually of determinable focal origin.

The question arises as to why the subjective symptoms should be so severe with minimal urinary pathology, and why in certain cases, so benign, with practically pure culture of colon bacilli, staphylococci or gonococci.

These observations have been made from a fairly large number of cases, the range of which varies from spontaneous recovery under very simple treatment to lethal termination without operation, and one death following a nearly hopeless nephrectomy.

Considering the diverse pathology the practically constant absence of casts is remarkable. These were found in four cases only and then in very small number. This emphasizes the fact that exclusive of miliary tuberculosis and gross surgical pathology in general, there are among others, two great and absolutely distinct forms of renal disease. The first form includes the medical nephritides described under the syndromes of chloruremie and azotemie by Vidal, and the various forms of interstitial, tubular and glomerular disease familiar in our literature. The first subdivision is purely chemical and the diagnosis of variety is made principally upon the respective quantitative retention and excretion of the chlorides, urea and its allied nitrogenous end products, and the presence or absence of edema. The second subdivision is classical and in-

cludes the familiar symptoms, mention of which here would be verbose, with the exceptions of the microscopical findings relating to casts, pus, blood and bacteria, and the presence or absence of albuminuria.

Differing from the first form, the second will be considered under the tentative title of bacterial, infected or (sometimes) surgical type, with the presence, as indicated, of pus and organisms even though in but small numbers. There are, concurrently, a high febrile course, renal and referred pains, urinary disturbances and the general aspect of severe constitutional infection. The blood count shows extraordinary variations in the number of white cells. Edema is of rare occurrence. The terminal phase is usually an overwhelming toxemia.

The consideration of mixed types must not be overlooked. It is questionable in the medical nephritides whether a pure type of any variety may exist independently. Possibly during beginning development and extreme termination a pathological entity might obtain, but the metamorphosis from a large red to a large white kidney and subsequently the development of the contracted granular gland occurs by liaison and does not pursue its course as a distinct form, beginning and ending in its pristine purity.

Therefore the ingrafting with bacteria and the formation of pus are quite as possible in an already nephritic disease. On the other hand assuming a pyelonephritis, why should there not be here similar cast findings considering the compounding of nephritis with pyelitis?

The pathology varies with the route of infection and whether or not the urinary tract was normal at the time of the infection. Briefly, then, and considering only a single type, in descending or hematogenous infection congestion is invariable. Associated with this may be ecchymoses of the gland and pelvis. In the acute forms the glomerular and tubular infiltration occurs. In the chronic form the

bacteria are liberated from the blood vessels and provoke a scale of lesions varying from abscess formation to sclerosis without suppuration.

A comparison is invited between this description and one concerning Bright's disease in general.

In spite of this, the fact remains that careful laboratory search failed to evidence casts in a decidedly large proportion of cases, and then only a few hyaline in each of three observations, and hyaline and granular casts in one.

The occurrence of blood in the urine causes several problematic complications. Of first order is the resulting presence of albumin in greater or less quantity which may mask a true albuminuria. A coarse differentiation may be made if the amount of blood is small and that of the albumin large. The true type of albuminuria does not enter largely in this description on account of the rarity of its presence.

The blood itself may be of other than renal origin, and this may (or may not) be negligible, and here exists a fallacy in routine examinations of the upper urinary tract that is extremely annoying. I refer to the bleeding from trauma. It is quite ordinary to have slight hemorrhage from the bladder neck in obtaining a catheterized specimen preliminary to cystoscopy. This part can be overcome by having the specimen voided; but not entirely eliminated, as often the frequent passage of urine is over a congested cervix that exudes blood. Red cells may be found in the output from one or both kidneys that are perhaps due to the passage of urethral catheters; the confusion in differentiating is apparent.

Be that as it may, the presence of blood in pyelitis and pyelonephritis is not as frequent or abundant as one would imagine considering the early stage pathology, and yet one of the cases had copious recurrent hematuria with pain and marked febrile course for a period of seven years, and the nephrectomized specimen was benign, nearly functionless fi-

brosed gland with obliterated calyces. The urine was loaded with pus but contained no casts.

The number of red cells has shown nothing of importance in this issue, but the white counts had such varying results that all attempts to associate the high leucocytosis with circumscribed suppurative processes failed.

The blood counts were made at the peak of illness and the highest count quoted. The proportion of polymorphonuclear leucocytes and lymphocytes showed no unusual variation.

In fact, a leucocytosis of varying intensity occurred in practically all cases, and the highest count (28,600) was found in a chronic pyelonephritis without abscess formation and the next to the lowest count (8100) was in a case of cold pelvic abscess of foul content which involved the right kidney by obstructing its ureter. The pelvic capacity was 25 mls and the catheterized specimen showed numerous pus cells and a few colon bacilli. The pain, temperature and sweats were relieved by a resident urethral catheter which drained for seven days previous to and three days following the laparotomy. There has been no recurrence of renal symptoms to date.

An intermediary count of 17,000 was found in a fulminant case of multiple abscesses with thick purulent discharge from the right kidney. The infection was so severe that the patient succumbed 24 hours after a too long delayed nephrectomy. Worse in pathology, but with a white count of but 13,300 was another case of multiple abscesses in which urinalysis showed no casts, very few pus cells and very few bacteria. This patient made a perfect recovery following nephrectomy.

In a fifth case, which had run a recurrent septic course for a long period, due to the emptying and refilling of a pelvis of pus 40 mls purulent content, a practically functionless gland was demonstrated. There exists a large uterine fibroid which unquestionably has been the

causative force. The white count here was 18,800.

Compare these cases with one running equally high temperature, and entertaining but few pus cells and few bacteria (coli), that showed a leucocytosis of 25,500 and which yielded to expectant treatment only.

The lowest count of 7300 was associated with a tender, large kidney with no evidence of other focal infection, that ran a septic course with drenching sweats for several weeks and finally recovered spontaneously. The urine showed no casts, many pus cells and but few bacilli.

From these few detailed reports, and those cases completing the series, it seems apparent that the blood count has no distinctive diagnostic value from a numerical point of view, that is, a leucocytosis of 10,000 is as efficient in information as a count of 20,000. Thus in no instance has it been possible to differentiate draining, mild urinary infections from closed collections of pus.

It is regrettable that blood cultures were not made in these cases, because

a bacteremia of some degree might have been demonstrated. Pus and bacteria in the upper urinary tract are not rare and are very commonly symptomless, and other factors such as retention, inflammation and resorption are the responsible elements producing the constitutional disturbances.

In a general way and without recourse to detail or statistics, treatment has consisted of kidney drainage by resident catheter and single or repeated pelvic irrigations. The use of vaccines was early abandoned. The majority of the cases in this last division were not treated until the urinary culture was sterile. The results so far as known have not necessitated such strenuous care and clinical cure was deemed sufficient. In some instances the cultures were negative, and here included were several cases of coli infection and one each of pure staphylococcus and gonococcus. One case of bilateral pure culture staphylococcus persistently resisted all therapy.

SOME EXPERIENCES IN THE SURGERY OF THE PROSTATE.*

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I shall limit my remarks on Surgery of the Prostate to some points which impress me as being of most interest.

ONE STAGE VERSUS TWO STAGE OPERATION. I formerly favored the one stage operation for most cases and in spite of much recent talk in favor of the two stage operation, I still believe that, in the majority of cases, there is very little if anything to choose between the two provided a thorough preparation is given the patient. Urologists have for many years realized that it is not so much the type of the operation as the thorough functional testing and proper selection of cases that spell the dif-

ference between success and failure. Some surgeons formerly did not prepare their patients at all or if they did, did not control the condition of their patients by thorough blood and urine chemistry, so that, after four to seven days of preliminary drainage had elapsed and when the patient's phase of resistance was at its lowest ebb, even much lower than when patients entered the hospital, the surgeon would operate and very often lose his patient from pyelonephritis. I prefer the two stage operation principally in three conditions: (1) bladder calculus, (2) acute retention, (3) those cases that do not tolerate the indwelling catheter.

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PREOPERATIVE TREATMENT.

An x-ray is performed upon the kidneys, ureters and bladder; also cystoscopy when the patient permits. I feel that I have done something toward putting cystoscopy in a happier position in the lay mind by employing gas oxygen anesthesia for this procedure. I usually insist that the patient be up and walking around before the prostatectomy whether it be one stage or two stage..

I consider it to be of prime importance that the patient be relieved of focal infections or annoying conditions before operation. The lack of resistance produced by operation has a tendency to cause flare-ups of these conditions, thus seriously complicating convalescence. Fistula in ano, abscesses, carbuncles, bad teeth, sacro-iliacs, etc., should be corrected before prostatectomy. The tongue should appear gray and moist. I routinely employ four laboratory tests (1) phenolphthalein (2) blood sugar (3) blood creatinin (4) blood urea. It is rather remarkable how some patients showing a very poor laboratory report will, after several months of preparatory treatment, get to be very good surgical risks. It is also surprising how some patients with perfect laboratory findings, and who get along without any post operative complications whatsoever, suddenly develop a dangerous flare-up of a myocarditis. This myocarditis may come out of a clear sky or may be traced to allowing patient to sit up too soon, to imperfect drainage, drinking too much water, careless nursing, infection, various reflexes, mental shocks or worries. The receipt of a bill by some individuals is the severest shock that could possibly be given them. The bill should be deferred until the patient has been at home and well for one month. Even at this late date I have seen a bill cause a prostrating myocarditis. With the high development that the science of urology has undergone during the past few years, death from pyelonephritis, from hemorrhage, pneumonias, infections, have been to a large extent eliminated. I

believe that myocarditis is the condition that most frequently causes exitus.

CATHARSIS. I depend upon castor oil, Hinkles pills, flaxseed tea and enemas. Flaxseed tea has entirely displaced liquid petroleum in my practice during the past four years. It is superior because (1) it is more soothing to the stomach and bowel, (2) it soaks up some excess of acid in the stomach, (3) it mixes more thoroughly with the feces thereby coming in better contact with all of the bowel surface and causing a more uniform softening of the stool. By the institution of this gastro intestinal hygiene I have practically eliminated gas pains, which when they occur are the most distressing complication following prostatectomy.

ANESTHESIA. I have always preferred spinal anesthesia because (1) there is less danger of hemorrhage, (2) there is less danger of uremia, (3) it gives most complete relaxation, (4) it does not irritate the kidneys to make them a locus minoris resistencia for infection, (5) there is no ether pneumonia. During the past year, however, I have been employing gas oxygen quite successfully. It is the ideal anesthesia for the first stage of the operation, and, although the relaxation is not so thorough as can be obtained by spinal or ether narcosis, I now employ gas in the majority of my second stage operations omitting it only in those cases that have very deep abdomens, in which cases I employ spinal.

HEMORRHAGE. I believe that ether is more liable to cause hemorrhage because it raises blood pressure. Spinal anesthesia lowers it. Furthermore, the muscular relaxation in the spinal anesthesia being more lasting, hemorrhage is not so liable to be induced by muscular contraction coming on too early. I cannot conceive of any excuse for losing a patient through hemorrhage following suprapubic prostatectomy. I rarely encounter any considerable bleeding at the time of operation. If it occurs I

immediately pack the entire bladder very tightly with a large roll pack and insert no drainage tube. This procedure will control any prostatic hemorrhage whatsoever, immediately. I learned it from the late Colonel Freyer eight years ago. All other methods are comparative; dangerous inasmuch as they are more time consuming and less certain. Elderly men have a lessened quantity of blood and they stand the loss of even a small quantity very poorly. I do not waste any time in trying to mop the patient's life blood up on sponges. It is better to have the patient's blood in his blood vessels than on the floor. I know that I have saved a number of lives by promptly employing this most effective method. Beginning about four hours after operation I remove a portion of the pack every four hours usually withdrawing the last piece after thirty-six to forty-eight hours have elapsed. A Pezzer catheter is then inserted. This is changed about every three days, a smaller catheter being employed each time down to about No. 18 French, after which a permanent catheter is usually kept in the urethra until the suprapubic wound is healed. By not being in a hurry to insert the indwelling catheter epididymitis is avoided.

HICCOUGH. Four years ago in a paper entitled "The Treatment of Pernicious Hiccough Following Prostatectomy" I described the form of hiccough that I chose to term pernicious, because it was almost continuous and interfered to such a degree with the patient's nutrition and sleep as to rapidly wear him out, and to cause his death from exhaustion unless checked. If a mild hiccough does not yield promptly to ordinary remedies we must resort at once to the most effective measures to check it before the pernicious stage has been reached, so that the patient's strength may be kept from ebbing away from starvation, from the exhaustion produced by constant spasmodic contraction of his chest and abdominal muscles and from loss of sleep. The pa-

tient is better able to stand heroic treatment at the relatively mild beginning of a stubborn hiccough than he is just before his exit. All medicine and food by mouth should be prohibited, and the stomach should be washed out with a one-half per cent soda bicarbonate solution once or twice daily. Hot compresses over the lower chest and abdomen are valuable. Two thousand c. c. of a one-half per cent soda bicarbonate plus five per cent glucose solution should be administered during each twenty-four hours either by the rectum, drip or hypodermoclysis. The administration of one-hundredth of a grain of atropine every two hours nearly always stops the hiccough after about four injections. Morphine is, however, the most effective drug of all, and should be pushed if necessary even to the stage where a rapid intermittent pulse ensues.

CANCER. I advocate the partial suprapubic prostatectomy for cancers of the prostate. The suprapubic operation may make life comfortable for from three to ten years and without the remotest danger of giving the patient an incontinence, fistula or other complication. The important consideration in operating is: Has this patient a rapid or a slow cancer? It is in those cases of slow cancer that so-called cures at the hands of hasty judges have been effected. It must be borne in mind that the patients with this type of cancer may live for many years either with or without operation provided the bladder neck is kept free from obstruction. At the Santa Barbara meeting of the California State Medical Society, 1920, I called attention to a procedure termed partial suprapubic prostatectomy for malignant prostates, and since then Dr. Geraghty has advocated partial prostatectomy by the perineal method. I reported two cases, one of whom I had operated upon fourteen months previously, and the other one two years and three months previously. The first named patient was seventy-two and the latter named seventy-

five years of age. The latter named recently completed a long automobile trip to Fresno during which he drove his own car. I may add that both of these patients are having considerable urinary frequency, but they are both active and happy. Both of them had bladder necks so contracted by cancerous infiltration that they could pass their urine only with the utmost difficulty before operation. They have had no difficulty since. The operative procedure is to remove as much of the prostate as can be readily done. In the second case above referred to I enucleated almost the entire prostate quite readily, but found it very adherent to the rectum so that I had to cut it off from this organ with a scissors. In the second case and the more usual type, after about thirty minutes of persistent gouging I succeeded in removing a piece about the size of my thumb.

This, however, gave the patient complete freedom from obstruction. Radical perineal operations for cancer of the prostate have proved disappointing from three standpoints: (1) they have not prolonged life any longer than a partial prostatectomy as outlined above would have done, (2) the most favorable cases that I have heard of upon investigation by myself were found to have complete incontinence, (3) the danger of exitus from shock and hemorrhage is considerable. General surgeons frequently quote cases in which they have encountered slow cancers such as cancer of the breast in which the patients live for many years and undergo repeated operations. Israel once told me of a case of cancer of the stomach which he removed, the patient dying nine years later from metastases in the liver.

URETER IMPLANTATION INTO GROIN.*

A New Procedure for the Treatment and Healing of Tuberculosis in a Single Remaining Kidney Following Nephrectomy for Tuberculosis of the Other Kidney. Report of Two Cases.

HERBERT A. ROSENKRANTZ, A. B., M. D., Los Angeles, Calif.

The heretofore hopeless condition of those patients who have had one tuberculous kidney removed and later develop tuberculosis in the remaining kidney is well known. Suprapubic cystotomy may for a time allay the symptoms of the ulcerated bladder, but finally the bladder contracts to such a degree or becomes so ulcerated that it will not tolerate the stump of a suprapubic tube. These patients have heretofore usually been given up as hopeless. I desire to cite two cases in which I transplanted the ureter of the remaining tuberculous kidney into the groin with return to practically perfect health of both patients—patients who without this

procedure would have died miserable deaths.

Case 1.—Patient entered hospital about five years ago. A right tuberculous kidney and epididymis had been removed by Dr. Granville MacGowan three years previously. Patient's bladder was in a badly ulcerated condition and he was passing his urine about every fifteen to thirty minutes day and night. Severe pains had caused him to become a morphine addict. I inserted a permanent suprapubic catheter as a palliative measure. This procedure relieved patient's pain immediately and he gained thirty pounds in weight. After

*Read before the thirty-first annual meeting of the Arizona State Medical Association, at Jerome, Ariz., June 15, 1922.

about nine months, bladder contracted to such an extent that it would not retain the tip of a tube, so that patient again became bed-ridden. About four years ago I transplanted his left ureter into his groin. The next day patient claimed that he felt better than he had in a year. He made a rapid recovery, and during the past three years has been actively engaged in conducting a chicken ranch in Michigan. I have received many letters from him expressing his appreciation of the satisfactory condition that he is in.

Case 2.—Patient entered hospital about two years ago. He was passing his urine every fifteen to twenty minutes day and night. Four years previously a right tuberculous kidney had been removed. He had a unilateral tuberculous epididymitis, a tuberculous prostate as big as his fist, so sore that he had not been able to sit down for several months. He was expectorating considerably from a well advanced pulmonary phthisis. On February 17, 1920, I implanted left ureter into groin under gas oxygen anesthesia. Recovery without shock. Three months after operation I demonstrated him before the Western Branch of the American Urological Association in Santa Barbara. He had no pain, was sleeping all night, and had gained eleven pounds in weight.. His prostate had decreased to one-half its former size and was no longer tender.. Since leaving hospital he has been actively engaged as a laborer on a fruit ranch

almost every day. He has laid up about \$2500.00 in the bank, and recently showed up at the White Memorial Clinic with an acute attack of gonorrhea. This patient had consulted first class urologists in some of our largest cities, and had been told by all of them that nothing could be done for him.

These patients wear a soft rubber catheter extending up into the kidney. The catheter empties into a flat bottle attached in front of the pubis or inside the thigh. The patient is instructed how to irrigate his kidney every day or two, and to change his catheter about every three days.

I believe that the above described procedure is the most satisfactory for this condition because (1) it is the simplest; (2) patient can take care of himself requiring no assistance; (3) there is no danger of obstruction to ureter due to adhesions, strictures or plugging with debris; (4) there is immediate and thorough drainage for any infection which may develop; (5) kidney pelvis is readily accessible to the physician for adjustments, treatment and hygiene; (6) the method is clean and free from leakage; (7) it is a one stage operation; (8) there is no shock; (9) by having the patient's kidney and ureter readily accessible and under control, there is eliminated the gambling chance that makes bowel implantation hazardous; (10) it offers patient the longest tenure of life.

KIDNEY FUNCTION.*

CHARLES S. VIVIAN, M. D., Phoenix, Ariz.

The most practical and consequently the most important fact concerning kidney function is that of determining at what point functional disability results in organic damage. When all of our tests are correlated this point are invaluable if properly interpreted, but are decidedly detrimental if they are allowed to outweigh other factors in diagnosis. Kidney effort is what we should attempt to measure. We should observe what the kidney will do under different circumstances, what effects different foods will have upon its function, and what improvement may be made by remedying any deficient extrarenal cause for failure on the part of the kidney. We should visualize the kidney as constantly moving at work and our tests as small samples of this work. We should take samples over a considerable period of time before reaching a definite conclusion. Having formed a comprehensive idea of the kidney's ability we are in a much better position to act as agents for its protection in that we can remove causes which are producing renal irritation. Post-mortem pathology, correlated with laboratory tests before death, have done much to advance our knowledge of kidney function. This procedure, indeed, is a great step in advance towards ultimate knowledge, but it is fallacious in that it fails to take into consideration the element of time. We have set arbitrary figures, particularly in blood chemistry, the presence of which we have been told indicate a grave, if not fatal, prognosis. If we find a patient whose blood contains these substances in a supposedly lethal amount, and who recovers, has the laboratory technician made an error? Or perhaps these are the exceptions which prove the rule. The question, then, which we must decide,

is how much kidney damage is functional and how much is organic? Functional ability improves; organic damage is stationary, or becomes more marked. Function may compensate for organic shortcoming, but it cannot remove it. The effort at equalization produces strain which in turn results in organic change. In order to arrive at a more definite understanding of the strain placed upon the kidney by different substances, a group of patients under active anti-syphilitic treatment were studied. Before beginning their treatment they were tested by means of the phenol-sulphon-phthalein test. After treatment was begun with neosalvarsan and in the interval between doses, they were given the phthalein test. The individuals in whom there was no indication of kidney damage showed a slight diminution in the amount of dye excreted as compared to the amount excreted before treatment was begun, but these individuals when tested in the interval between doses of neosalvarsan showed a return to the normal figures. Kidney insufficiency was suspected in every case which complained of a reaction following administration of neosalvarsan, and it was found in a number of these individuals that only a small amount of the dye given at the same time the neosalvarsan was given, was excreted in two hours following. One case of exfoliative dermatitis was studied to determine the factor of kidney damage in the production of the skin condition. The patient came under the care of the writer at the first of the present year in the free clinic. At the first examination she presented the characteristic lesions and symptoms of exfoliative dermatitis, which diagnosis was concurred in by several other

* Read at the thirty-first annual meeting of the Arizona State Medical Association, at Jerome, Ariz., June 15, 1922.

clinicians. She gave the history of marked reaction following each injection of neosarsphenamine. The reaction consisted of nausea and vomiting and a peculiar itching of the skin followed by the apparent characteristic dermatitis. Her kidney function as measured by the phthalein test, while she was still suffering from her dermatitis, was below normal although she was not at this time receiving any specific medication. The administration of alkali quickly improved and entirely cleared up her dermatitis. Following this apparent cure of her dermatitis another injection of neosalvarsan without the administration of alkali served to reproduce the dermatitis. After alkalization of the patient and taking her off of protein diet, it was possible to give her repeated doses of neosalvarsan without producing the skin manifestations of poisoning and, what is of more importance for our discussion here, her phthalein excretion was much improved.

In a previous communication on this subject, the inference was drawn that exfoliative dermatitis resulted from a back-up against the kidneys from a mechanical or nephritic cause, and that the effect upon the liver was secondary to the overloading of the blood stream with arsenic. While we have only studied one case, it has been shown by numerous other investigators that alkalization of the patient was a preventative of dermatitis. The behavior of the kidney as measured by the phthalein test following alkalization, seems to strengthen this position of kidney back-up. It has been known for some time that alcohol and anti-syphilitic treatment did not mix well, but we have not known the exact way in which the damage was brought about. In one case under treatment with neosalvarsan, the effect of alcohol was to produce a marked reaction on two occasions. Both of these reactions were accompanied by a rise of systolic blood pressure to around 180 mm., a diminished phthalein excretion and symptoms of uremia.

After the alcohol was withdrawn and the phthalein excretion had gradually returned to normal as measured daily, the same dose of neosalvarsan was well tolerated.

It was found in supposedly normal kidneys following neosalvarsan that not only is the total amount of the dye diminished, but that there is a tendency for the two hours' excretion to approach each other in percentage. It has been shown that this equalization in the two hours is always an indication of renal damage. In practically all the normal cases studied in the interval between doses of neosalvarsan, the kidney function as measured by the phthalein test apparently returned to normal. This fact, together with the one previously mentioned, namely, the equalization in the two hours excretion, would lead to the conclusion that the administration of arsphenamine is very apt to produce retention of arsenic and poisoning in a degree proportionate to the amount of kidney damage, assuming that there is a parallelism between the excretion of arsenic. Most certainly, in the light of these findings, it would be very unwise to continue the use of salvarsan in the face of failing kidney function as shown by the phthalein excretion, particularly if alkalization and curtailment of protein intake were ineffectual in raising it. This is the point at which you should stop treating your patient for syphilis, regardless of any rule of thumb. The kidney will recover under proper rest and it should not again be taxed until it is proven to be functionally capable by the phthalein and other tests.

Up to this point, very little has been said concerning any substance other than protein, because we all know that protein is one of the things which is apt to produce kidney damage, and one of the things which is held back in the blood. Protein, however, is by no means the only food element which produces trouble in the kidneys; it has been shown by numerous investigators, that sugar is frequently stored up in the blood

in cases of kidney damage. And it has been assumed that this was a step further in the progress of the so-called nephritis. The author believes that there are kidneys which are perfectly capable of caring for protein which are unable to cope with an increased intake of carbohydrate. It has long been recognized that a small quantity of sugar, too small to be recognized, by the ordinary test, is a normal constituent of the urine. If, for some reason, the exact operation of which we are not concerned with at the present moment, the kidney does not excrete this small amount of sugar, there is stored up in the blood an abnormal amount.

This increased amount of sugar in the blood may be found in several ways. The so-called renal threshold may be exceeded and sugar may be found in the urine. Or a hyperglycemia may be found upon routine blood examination for sugar. The question of sugar retention as well as of protein retention, should be considered in cases of hypertension. More particularly in those cases which complain of somnolence and inability to fix the attention upon the subject in hand. It is quite necessary of course to consider the possible diagnosis of diabetes mellitus.

Those cases which have come to the attention of the writer who have had kidneys impermeable to sugar have not had any of the symptoms of diabetes. The three cardinal symptoms, polydipsia, polyuria and polyphagia, were conspicuous by their absence.

Diagnosis between diabetes mellitus and glycosuric nephritis, if we may be allowed to use this term, may be made in another way, besides the negative one of the absence of the symptoms of diabetes, by the fact that it requires a long intake of carbohydrates to produce a hyperglycemia in the nephritic cases. Whereas, true diabetics will spill sugar into the urine on less than one hundred grams of carbohydrate intake after a fast. It is only necessary in these individuals to limit the carbohydrate intake to produce a marked improve-

ment of symptoms and to prove the statement just made. The inability of the kidneys to excrete sodium chloride with the consequent retention of water and its resulting edema has been recognized for some time, and has been taken advantage of, in treatment. Sodium chloride, however, is not the only salt which is not excreted by some kidneys. The continued use of magnesium sulphate in some individuals will defeat the very purpose for which it is given in edema, through the same process. This is true also of some of the calcium salts, which are given for diseases of the stomach and colon, to the detriment of the kidneys. Given the case of nephritis, then, we should not be content until we have eliminated every possibility with regards to retention by the kidneys. And because of the wide tract of unexplored kidney function, we should be ever upon the alert for substances which may be ingested by the individual, having in mind particularly the salts of the heavier metals.

To summarize, it is necessary, in order to appreciate the functional disability of the kidney, to make more than one test and it is also necessary to make different tests more than once under different conditions, so that the ability of the kidneys under certain varying conditions may be determined and a picture of the total disability of that organ may be formed and fully appreciated. That the element of time required for the kidney to return to a more or less normal level following trauma enters as a factor in determining the disability of that organ. That, by this method it is possible to stop short of damage to the kidneys, particularly in the treatment of syphilis. Also, that it was possible, in a case of exfoliative dermatitis, to demonstrate by the phthalein test that the kidney function during the presence of the disease showed a figure below that of normal, that the function improved following alkalinization and that the dermatitis returned and the kidney function fell when the alka-

linization was given up and the treatment with arsenic resumed. Sugar may be retained in the blood and

produce symptoms similar to those produced by the retention of the end products of nitrogen metabolism.

ABSTRACTS

Marginal and Jejunal Ulcers Following Gastro-Enterostomy. F. C. Schuldt, M. D., F. A. C. S., St. Paul Minn. *Minnesota Medicine*, April, 1922.

The ulcer may be situated in three anatomical areas: (1) On the gastric side; (2) on the suture line; (3) in the proximal limb, distal limb or mesenteric border of jejunum. They are usually single, though several cases of multiple ulcers have been reported. He quotes Roojen's five types of jejunal ulcer: (1) Ulcers without symptoms which heal; (2) with pronounced local and general symptoms; (3) with acute perforation; (4) with tumefaction and inflammatory infiltration into the anterior abdominal walls; (5) ulcers which develop jejuno-colic fistulas.

In one case which is reported in detail, the x-ray findings were quite definite. There was a penetrating ulcer and a constant incisura on the lesser curvature opposite the ulcer.

The author discusses the etiological factors at some length, summarizing them into the following: (1) Faulty technic in controlling bleeding; (2) Unneutralized acid chyme; (3) Non-absorbable sutures for inner sutures; (4) too much clamping of tissues or a Murphy button; (5) infection.

Note on Sacralization of the Fifth Lumbar Vertebra. By C. Thurstan Holland, D. L., M. R. C. S., Lecturer on Radiology, The University of Liverpool.

The *Journal of Bone and Joint Surgery*, April, 1922.

The author briefly reviews the growth of interest in this interesting anomaly, and cites ten cases which have come to his attention during the year 1921. He summarizes the causes of the symptoms which are usually found in these cases,—pains of various sorts centering in the lower back. These symptoms have been said to be due to,—(1) Actual pressure on nerves or nerve trunks; (2) Ligamentous strain; (3) Compression of soft tissues between bony joints; (4) Arthritis when a joint is present; (5) By a bursitis when a bursa is present.

A Study of 208 Cases of Lower Back Pain. By J. R. Kuth, M. D., Duluth, Minn. The *Journal of Bone and Joint Surgery*, April, 1922.

Reports study of 208 cases of low back pain, not including cases of manifest injury or disease of the lower back structures. Series includes 136 males and 72 females, ranging from 12 to 70 years in age. The etiological factors determined were as follows: (1) Static factors, such as short leg, old fracture of lower extremity, foot deformity, obesity, marked cases of general weakness; four cases of this group showed definite lipping of one side of the fifth lumbar body; sixty cases are included in this group.

(2) Traumatic, where symptoms followed falls, direct blows, or sudden strains from lifting; there were 27 cases in this group.

(3) Infections, when there were definite local and general symptoms of infection, or where the symptoms followed cold and exposure, or when there was definite x-ray evidence of osteoarthritic changes; there were 33 cases in this group.

(4) Gynecologic, following pelvic disease in women, after operation for pelvic disease, or associated with pregnancy or parturition; there were nine cases in this group.

(5) Neurologic cases were five in number.

(6) Malignancy (five cases).

(7) Lues (two cases).

(8) Tuberculosis (two cases).

All but 34 cases were x-rayed, usually with negative results. The positive x-ray findings were as follows: Osteoarthritis (ten cases); arthritic changes (nine cases); transverse process anomaly (nine cases); spina bifida occulta (one); sacroiliac lipping (one); spur on iliac crest (one).

The anomalies of the fifth lumbar transverse process included clubbing, sacralization, and impingement of the process.

While trauma was given by the patient as a cause of the pain in about one-half the cases, it was considered by the examiner to be the cause in a little over 18 per cent.

In this series there was no case which the author felt was due to sacro-iliac relaxation or subluxation.

He concludes that the symptoms will be the same whether the injury or disease affects the muscular, ligamentous, bursal, osseous or joint structures; also that unfavorable static conditions in the lower back or extremities may produce symptoms alone or in conjunction with other causes.

Low Back Pain, A Clinical Study of Its Cause. By John T. O'Farrell, New Orleans, La. The *Journal of Bone and Joint Surgery*, April, 1922.

This author reviews forty cases of lumbosacral pain, with regard to the method of onset, the location of pain, the effect on spinal motion, and the association of infectious foci elsewhere in the body.

He regards the pathology to be a sprain of the lumbosacral ligaments, entirely analagous to a sprain of any other joint, with very little importance attached to bony abnormalities, or to x-ray examination unless fracture is present.

He considers that a secondary infection is frequently super-imposed and that eradication of infectious foci should be a part of the routine treatment, and this treatment should be based on the principles which apply to sprains elsewhere.



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MENTAL HYGIENE IN ARIZONA*

THOMAS H. HAINES, M. D., *Director of the Arizona Mental Hygiene Survey,
National Committee for Mental Hygiene, New York City.*

The Arizona State Medical Association helped bring an opportunity to the National Committee for Mental Hygiene to serve the people of Arizona in the survey which we have now completed. The National Committee for Mental Hygiene returns the favor by bringing to the physicians of Arizona a special opportunity to serve the people of this state.

Many of your members were active in securing for the National Committee for Mental Hygiene the invitation of Governor Campbell and the invitation of the Legislature in April, 1921, by which we were asked to "conduct a survey of all state, county and city institutions, as well as in the public schools of the state." This association also backed up these invitations by substantial offers of moral support. We have had cordial cooperation from every member of the association upon whom we have called. We know, therefore, that you want to know what we have discovered. We know that you earnestly wish to canvass the situation and see what can be done for the mental health of the people of Arizona. We cannot make you a formal report at this time. This report must be in the making for the next two months, but we can promise that before the sum-

mer is over the manuscript will be available. Way now seems to be provided for the publication of 2500 or 3000 copies.

We can report that we have more or less intimate personal histories of upwards of ten thousand of your citizens. We have examined upwards of nine thousand children in schools, mostly public, but some private, and some federal.

We have thus comprised within the survey upwards of 2700 children in Maricopa county, 2200 in Cochise county, 500 in Tucson, 600 in Miami and 1500 in six other counties. These latter are mostly rural schools.

To give an idea of the kind of result obtained in these school surveys we find among 2771 children in Maricopa county, comprising three schools in the city of Phoenix, the following mental diagnoses:

	Number	%
Superior	186	56
Normal	1553	56
Dull	752	28
Borderline	131	5
Mentally defective	79	2
Psychopathic personalities..	68	2
Psychoneurotic	1	....
Epileptic	1	....

2771

*Read before the Arizona State Medical Association at Prescott, May 14-16, 1922.

Similarly the 2287 children in Cochise county yield the following diagnoses:

	Number	%
Superior	125	6
Normal	1507	66
Dull	474	21
Borderline	55	3
Mentally defective	38	1
Psychopathic personalities..	86	3
Psychoneurotic	1	....
Epileptic	1	....

2287

It should be borne in mind that the survey in Cochise county comprised practically all of the school children, including the High School in the city of Bisbee, whereas, the larger part of the children in Maricopa county were in rural schools, and very few in high schools. This analysis of the two counties will be borne out in general terms by the analysis in general terms of the rural schools of the state.

It is evident that some of the most serious educational problems in Arizona have to do with the Mexican and the Indian. We have made diagnoses of thousands of Mexican children in the public schools. To enable us to come at the problem, however, of the education of the Mexican and of the Indian directly, we have had the cordial co-operation of the Phoenix Indian School, of St. John's Mission, in the desert near Gila Crossing, and the Indian Training School near Tucson. Of the 1030 children found in attendance at the two schools, first mentioned, we made the following diagnoses:

	Number	%
Normal	383	37
Dull	478	47
Borderline	71	7
Mentally defective	66	6
Psychopathic personalities..	27	3
Psychoneurotic	1	....
Epileptic	3	....
Mental disorders	1	....

1030

The problems of examination of the Spanish-speaking Mexican and of the Indian who has not learned suffi-

cient English to communicate in that language are special ones for both the psychologist and the psychiatrist. These children, however, have been in school for the most part a sufficient length of time to talk fairly well, and where necessary we used as interpreters children who commanded both languages involved. We believe that we have arrived at reasonably true views as to the mental equipment of each one of these children. There is a large increase in number of dullards as well as the various degrees of defect and disorder among these children as compared with white children.

Similar diagnoses have been made of the boys and girls of the Arizona State Industrial School, and of the men and women at the State Prison. An analysis of the conditions found at the Industrial School will suffice to illustrate the mental conditions underlying or accompanying recalcitrant youth. Of the 118 boys and girls present at the time of the survey, we found the following mental diagnoses:

	Number	%
Normal	27	23
Dull	34	29
Mentally defective	9	8
Borderline	9	8
Psychopathic personalities..	35	30
Psychoneurotics	3	2
Epileptics	1	.84

118

The relatively small percentage of mental defectives, less than twenty per cent, amongst these children, will be somewhat of a surprise to some who have emphasized the importance of mental deficiency in explaining juvenile delinquency. An especially large number of dullards, particularly among boys, is found, but there are really well-equipped boys and girls in this population. The modes in the distribution shown above are of psychopathic personalities and dullards. Psychopathic persons cannot be called mentally defective in intelligence with which psychopathic persons are afflicted.

Theirs is a malconstruction of that part of mentality which we call character. Character is the organization of the personality. This is a defect in the organization of the person. When we consider that character consists largely in the organization which is acquired in the processes of socialization, we understand that this so-called psychopathic personality is in large measure an acquired defect. It exists either because education has proceeded wrongly or because education has not had the opportunity to work its effect upon these individuals. This being true, we see that the defects of these persons are correctible defects, and that these children are most properly placed in a sort of superior school, a special school definitely organized for the purpose of ministering to these unfortunate individuals who have failed so far of the proper socialization. The business of this school is primarily socialization. The business of every school is primarily to make citizens, but these delinquent adolescents are the most knotty of all their problems which the social workers, the courts, and the schools have sorted out for this school.

That the school should be burdened with the feeble-minded is, however, an example of one of the greatest errors in our social thinking. The feeble-minded do not belong there. The same kind of problem exists, or should exist, in the state prison. The rehabilitation of these men, the reconstruction of their characters so they cease to be trouble makers, and so they are placed in constructive cooperation with other men in civil life is the prime reason for the existence of the penitentiary. Happily, work, occupation, is the best means for this therapeutic process. When these able-bodied men are given the proper opportunities for working themselves back to normal relationships in the community, the state will be put at much less expense for the maintenance of this institution. There is no real reason, based on the science of criminology as aided by medicine and

psychology, why the state should be at any expense for the maintenance of adult delinquents.

The above remarks hold equally with regard to delinquents in county and city jails. In these institutions in Arizona there are continuously more than 500 able-bodied men. They are kept while waiting trial and while serving sentences in these jails under conditions least desirable from the mental hygiene point of view. The idleness, the confinement, the social relations and sometimes the filth in which these men are kept all tend to contribute to the degeneration rather than to the upbuilding of character. Employment in the open air should somehow be obtained for every person whom society finds it necessary to confine on account of delinquency or suspected delinquency.

In addition to the statistical data which we shall be able to put in your hands in the report as outlined above, we shall have some close-up studies of some of the least desirable families in Arizona. Miss Sessions has made some careful family studies of human parasites who have fed long at the public expense in this state. These family histories will suggest the high desirability and importance of control and management of some of these people who are so ill qualified to manage themselves with fairness to the rest of society. Some of them are delinquents, some are dependents, some are feeble-minded, and some are psychopathic. In every case, however, the mental condition will be shown to be the fundamental cause of the dependency or of the delinquency, and this cause will be shown to be more or less hereditary in character, so that the family as such is to be classed amongst the undesirable, the unfit, and, therefore, suitable for elimination. It is a part of wisdom to work out means of managing such families, not only for the present minimizing of the expense to which they put the public, but to minimize and ultimately eliminate the expenses for such stocks in the state. In other words, community control of

the breeding of the unfit is the clearly indicated goal to which Arizona should work in the future. This is the first and prime result of such studies of your people. Such studies are affording to you important material upon which to base your educational campaigns and your legislative action.

I realize that public health questions have not come very intimately into the every-day working life of the average practitioner. Yet the community is very properly coming to look to the doctor for guidance in these matters. His studies of biology and his intimate relations with family life, particularly at births and deaths and the illnesses incident to these occurrences, put him in a position to appraise the importance of eugenics in its bearing upon community welfare. They know he is, therefore, in a position to lead others, so to shape community action as to bring about a better state of affairs.

In view of the strategical position, therefore, of the medical man in the community in reference to these bearings of biology upon community life, I respectfully ask each one of you to seriously consider the facts brought together in the report of the Arizona Mental Hygiene Survey. I also ask of each of you to try to find opportunity in his community to spread abroad these facts and to interest the people in making plans for better community organizations in Arizona. If each physician in this state would thus make it his avocation for the next six months to study the facts and to discuss the plans and to arouse intelligent discussion of the same, there can be no question but that Arizona would as the result of action at the next session of the Legislature, take a very forward position among the states in regard to her management of mental health problems.

The story is an old one as to how easy it is to get appropriations for improving live stock, for improving anything which makes for the material wealth of the community through better agricultural methods, and how

difficult it is to get anything done to improve the human stock. But this is simply because the community has not stopped and considered the importance of these matters.

It is evident to anyone who will stop and think that the first asset of any community is constituted by the people who compose the community itself. It is not its material resources, not the fertility of its soil or the hidden mineral wealth, or the superb character of the climate that makes a people great. It is the kind of human stock which lives in that region that makes the community. It is equally evident that the mentality of any stock is the first index of its value, individually and collectively.

It is, therefore, vastly more essential to the community to preserve and improve the mental health of its people than it is to keep pure the long-staple cotton of the region, or to secure more water for more of the fertile land in the region. We recognize the basal character of both of these assets as regards the prosperity of the community. Even with this recognition, however, there is nothing to retract in the above comparison. The mental health of the people is basal to these fundamental factors.

1. SPECIAL SCHOOLS.

The report of this survey will contain various recommendations which seem to us desirable for Arizona to follow out in order to obtain these most important ends. It is important to arrange for the special education of the dullard and of the defective in the public schools. There is at present much energy wasted in attempting to teach ill-organized minds matters which they are incapable of understanding or utilizing. At present much energy is wasted in our schools because of illogical classification of the children in the schools. Far better results can be attained with less expenditure of effort when the dullards and the mentally defective are segregated and are taught in the manner in which nature seems to have designed them to be instructed.

The primary end in education is the organization of character. The fundamental means thereto consists in the coordination of movements. By co-ordination effecting constructive efforts the human mechanism learns how to think and to accomplish ends. Some of these dull minds can learn only through the use of their hands. The time expended upon purely literary education or attempts thereto is worse than wasted both for the teacher and the taught; worse than wasted because it is perverting the tendency to activity in the mind of the would-be pupil. He learns to waste his time and forms bad habits instead of good ones, because there is nothing afforded in the curriculum of the school in which he can be naturally interested, and we know well that if interest cannot be natural, it cannot be.

2. STATE SCHOOL AND COLONY FOR MENTAL DEFECTIVES.

Some of these peculiarly limited individuals cannot be properly treated in a public day school. Others have not proper homes in which to be maintained in order that they may attend a properly organized day school. It is necessary, therefore, to have a public institution in which proper training can be afforded for mental defectives of educable age. Such an institution need not be an expensive building or group of buildings. In your climate in southern Arizona shelter is no great desideratum and the educational facilities demanded by these people being primarily only those requisite for training in the arts of the household and of the farm, it is readily seen that they may be kept and treated at much less expense than some other classes of pupils and patients.

3. STATE CLINICS.

The state needs clinical facilities for the diagnoses of the mental conditions underlying social problems, whether these problems occur in schools, in associated charities, in other philanthropic agencies of like nature, or in connection with probation officers and courts. It is of pri-

mary importance to know of the mental condition of the case in hand. It is as important for the court to know from the psychological point of view the causes leading up to the offense before undertaking to administer a sentence designed to recover the delinquent as it is important for the physician to diagnose the disorder before he administers treatment.

4. STATE MENTAL HYGIENE BOARD.

It is also important to have some supervisory agency in the state which would be able to exercise control over mentally defective and mentally diseased persons outside of institutions. The state hospital for the insane is frequently able to parole patients partly recovered. It would be able to parole more patients with safety to themselves and to the community if there were a properly organized bureau able to supervise the life of the patient in the private home to which he was paroled. Likewise feeble-minded persons could be paroled from state institutions for their treatment and care under the supervision of the same bureau, when it would be utterly impossible if there were not such social workers to arrange for the parole and supervise the patient during parole.

5. CONTROL OF MENTAL DEFECTIVES IN THE COUNTIES.

In the same way many mentally defective persons could be managed in the community quite safely to themselves and to the community without ever going to a special institution for treatment or for custody, if there were such a properly organized parole bureau for mental cases. In other words, a department of public mental health looms large on the horizon. This department would properly have charge of the State Hospital and all its work. In such cases it would have a psychopathic service in connection with this hospital. It would have charge, partly through its state hospital staff, of clinics for out patients held both at the institution and at stated times in other parts of the state. It would be prepared to render service to courts

and possibly to schools where clinical examinations seem desirable and to aid in understanding the mental conditions involved in various problems as they arise. It would have charge of the state institution for mental defectives. This would comprise administration of epileptics. It would very properly be put in a position of collaboration with the parole agency of the State Prison and the Industrial School.

What form such administration of mental methods in Arizona should best take at the present time, I do not believe anyone is prepared to say in detail. That there should be such unified mental health administration, that this administration is most fundamental to the health of the community and that it will pay a good return in increased prosperity to the community, is beyond the peradventure of a doubt.

That such administration must be organized as good business is equally

clear. It should be the people's business. This is a representative government. But the people's business is well managed at the University of Arizona by a non-partisan Board of Regents. The Arizona Mental Hygiene Board should be non-partisan and should employ experts to do their work. These experts should be secured on account of their expertness without regard to residence or political views. They should be secure in tenure while they continue to improve the service they engage in.

To you gentlemen, most intimately acquainted with the health conditions in the state, I earnestly commend the consideration of these problems, that have to do with that part of the person found above the collar. You are in a position to help your communities and your state to intelligently discuss these matters, to help them form plans to bring to the State Legislature, and to help the Legislature to effectuate such plans.

INJURIES TO THE FACE AND JAWS*

W. T. COUGHLIN, M. D., F. A. C. S., *Director of the Department of Surgery Saint Louis University, Saint Louis, Mo.*

It is perhaps true that in order successfully to treat injuries of the face and jaws a certain amount of special knowledge is necessary. This special knowledge is something that may be easily acquired by any general surgeon who wishes to give it proper study.

For the past few years public attention has been more particularly called to these injuries and to the skill exhibited by those who were engaged in their repair. This work appeals to the lay imagination and for that reason prominence is given by the lay press to the success obtained in this branch of surgery.

The results can be seen, each case becomes an advertisement; perhaps

that is one reason why the general practitioner stands in dread of such cases and even the ordinary surgeon much prefers other kinds of work. It seems to me, however, that the real reasons why there are so few who adopt this work as a hobby are because it requires a certain amount of artistic talent, a very great deal of painstaking attention to seeming trifles from start to finish, a very thorough knowledge of general surgery and, besides all these, the financial compensation is usually inversely proportional to the amount of ability and work required.

The surgeon is confronted with an injury to the face. If he would obtain the best results he must visualize

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immediately the ultimate result. Every act that he performs from the removal of the smallest shred of tissue to the tying of the last of the smallest sutures must bear upon that result. And in direct proportion to his ability to do this and at the same time observe all of the fundamental principles of surgery will his results be good.

I have been asked whether one should devote his whole time to this kind of work. That depends altogether on the individual. There are individuals who are utterly unable to do more than one thing well and there are others who do better work when they have more variety. I think that this kind of work should be practiced as a sort of "hobby" and by someone who is considered by his fellows a good general surgeon. Whether he practices general surgery or not is a matter of his own choice. It is almost certain that those who are not well qualified will not be permanently successful, so that this is a sort of self-limited specialty.

In regard to the variety of the wound, whether it be incised or lacerated, there are certain differences in first treatment. Incised wounds of the face anywhere above the level of the lower jaw, whether they go quite into the mouth or nose or not, should be immediately repaired, and if below this level, but not opening the oral cavity, they should also be repaired at once. Therefore, all incised wounds may be closed without drainage except those which enter the mouth cavity below the level of the lower gum.

Wounds that cut through the salivary ducts are prone to be followed by fistula formation. To avoid such an unpleasant sequel all that is necessary is to make a passageway from the proximal cut end of the duct into the oral cavity and keep this passage open. The superficial tissues can then be closed at once and usually they heal quickly. The new formed channel should be large enough so that the saliva discharging from the cut duct can at once flow into the

mouth. A little flap of mucous membrane can be drawn into the channel and its tip fastened to the proximal cut end of the duct. This flap will soon form itself into a tube which will remain permanently patulous.

If the wound above the lower gum level be lacerated or contused it is better practice to close partially; that is, to leave drainage space. Rubber strips make the best drainage material. It is rarely necessary to excise face wounds, and if excision is ever practiced only a very thin surface layer should be moved.

Wounds which open the air sinuses are likely to cause complications. If such a wound is at once closed tightly some exudate or blood is likely to collect in the sinus; soon suppuration ensues and the result may be serious. A good rhinologist as a co-laborer in such a case is a great help. He can perhaps keep passages open and sinus cavities cleaned and primary healing is the rule unless the wound is grossly infected from the first. If the infection is certainly established, as evidenced by redness, swelling, etc., by no means should any attempt be made to close such a wound, whether excision is practiced or not. Any wound involving any of the air sinuses may be complicated by cellular emphysema. It may spread widely. It can be prevented either by leaving the overlying wound widely open or by closing the opening from the sinus into the nose by packing. It is only likely to arise within the first forty-eight (48) hours, unless the patient sneeze or cough or blow the nose a great deal when it may happen as late as the second week (perhaps later). Such actions should be prevented as far as possible.

As has been stated, wounds opening the oral cavity below the level of the gums of the lower jaw should not be at once closed tightly. Many say close partially allowing for drainage. All of the really dangerous cases I have had and all the deaths were in those who had been "closed with drainage." Therefore, I leave all such wounds wide open and see

that every recess and cavity in such a wound is loosely filled with iodoform gauze. None will die of infection and none will have secondary bleeding, although some may get well with a fistula.

Any wound of face or neck that opens into the alimentary tract must be regarded as more serious on that account. Sometimes the mouth of the patient is altogether filthy and at all times it is regarded as potentially septic. Pyorrhea and caries are most astonishingly frequent and not confined alone to the lower classes. A dirty wound in the mouth soon gives a foul smell to the breath. Any patient may have a foul breath from causes other than putrefaction in a wound, but the stench from a putrefied wound is unmistakable and always a sign of lack of attention.

The mouth and pharynx in patients who cannot eat in the ordinary way can be kept clean only by brush, wash, and gargle. The cleansing wash or gargle may be any non-irritating antiseptic. The important thing is not what to use, but how and when to use it. The teeth and gums are cleansed three times a day at first, and by a trained attendant, later once or twice daily and the patient may do it himself. The mouth is washed once every hour while awake and for the first few days the patient is awakened every two or three hours at night. After he has washed his mouth he gargles with the same solution. I still use Dakin's solution full strength for the first few days in all cases where oral or pharyngeal mucosa has been wounded. When it begins to irritate it is diluted half, sometimes with water, sometimes with potassium permanganate, 1 to 2000 or 1 to 4000. Dakin's solution dissolves catgut or silk and may be responsible for bleeding, therefore, when arteries have been ligatured in the wound it should not be used during the first forty-eight hours; Dobell's solution will do quite as well. When the patient is physically able, he himself is made responsible for the condition of his mouth.

There *must not* be any stench after the patient has been in the hospital twenty-four hours. It is not only on the wound itself that a clean mouth exerts a beneficial influence, but on the general condition of the patient, mental as well as physical.

Foreign bodies should always be sought for if the wounds are deep, whether the wounds are caused by missiles or not. I have removed part of a knife blade from an incised wound. The x-ray may not always show the foreign body.

If a fracture of the jaw complicates a wound of the face, there ought to be no delay in treating the fracture. I have often had much difficulty in getting certain of my colleagues to view this matter in the same light as I do, but I think it is so obvious that a displaced and broken bone should be replaced and retained in position at once that I cannot discuss the matter. It is not so important whether we shall immobilize in open or in closed bite as it is that we shall reduce and immobilize at once. In fractures of bones not likely to be drawn out of position by muscle pull or scar formation or in those in which malunion or vicious union will not materially interfere with function, this is not of great moment, but in fractures of the jaws it is most important.

There is always the question of what to do with loose pieces of bone and loosened teeth. If pieces of bone are in the wound and not sticking out into the mouth or not entirely free, they had better not be removed at once. Many times have I observed fractures which came diagnosed total loss of substance of the lower jaw for distances up to 2 cm. get well without bone graft of any kind, the repair across the gap being made by new bone formed from or along the periosteum. Periosteum *thus forms new bone*, but only when it is irritated or inflamed. The small fragments left in situ provoke irritation. The site where they lie should be kept carefully drained, otherwise os-

teomyelitis will ensue with dire consequences.

Teeth which cross a line of fracture or which are loose at the site of fracture may not cause any trouble, but as a rule they prolong suppuration if infection is present. And if suppuration occur osteomyelitis ending in non-union or worse may ensue. It is best to take pictures every week, and if there is any sign of absorption around their roots remove at once. If any remain loose at the end of three weeks they should then be removed.

There is one fracture in which immediate reposition and retention should never be done and that is the "cranio-facial separation," so called by the French. Here free drainage must be allowed or meningitis may ensue, and if the face is pushed and held forcibly against the cranium in reduction drainage will be interfered with.

It often happens that wounds which are best left widely open till danger of widespread infection or secondary hemorrhage is past would, if left to themselves, take long to heal and heal with great deformity due to retraction of tissues. Healing time can be greatly shortened and the deformity due to shrinkage can be much prevented by the use of light elastic traction. It is important the pull be only slight but constant. If it is more than just enough the blood supply to the edges of the wound will be interfered with and they will cease to heal and may even slough.

Crusts should not be allowed to form on wounds. They harbor infectious organisms. Frequent removal is not so good as to prevent their formation. This can be done by spraying once in two hours with hypertonic salt, or any of a variety of antiseptics. D- Chloramine-T in oil is of value, but it irritates the skin round about.

Whether to use dressings or not is a question the surgeon in charge must

decide. If the wounds are not secreting, they heal better without dressings. In fact, I believe almost all wounds heal more rapidly if left exposed provided the secretions are sprayed away before they form crusts, and the surface is kept warm.

If the edges become infiltrated or inflamed, however, copious wet dressings renewed as soon as they cool are indicated. If any redness or thickening with increased tenderness appear at the site of a broken bone, it should be opened to the fracture site as soon as possible. To wait for fluctuation is to court osteomyelitis.

Whether to do any plastic operation immediately after the accident is a question sometimes. It seems to me (after having tried it and having seen it tried early) that it is better to wait in most cases. One can never tell just how the tissues of the individual are going to react to the injury. Some are very susceptible to infection. Some infections are very virulent, flaps slough, and even life may be lost! I make it a rule now to do no plastic operation as long as there is any open surface near.

The feeding of patients who have wounds of the mouth or pharynx is something very important. They cannot take the usual food in the usual way and often they do not get enough to nourish them. It is easy to get the food well down into the esophagus by means of a tube passed through the nose. If there is difficulty at first a little cocaine sprayed into the nose ten minutes before passing the tube works well. I often have a patient train the beginner. The tube must be passed "straight back" along the floor of the nose through the more open side. When the pharynx is low down or the esophagus is wounded the tube is passed to some distance beyond the wound, anchored in place and left in.

It is of great advantage to have these patients associated with others of their kind. My ward cases are always more cheerful and less troublesome.

INFANTILE SPASTIC PARALYSIS*

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(American, English and German writers are prone to use the term Little's disease in a generic sense to embrace all cerebral palsies in childhood, while the French writers use this term only in cases where there is a defective pyramidal tract in the spinal cord and brain. In this paper I am using the term to embrace all cerebral palsies of childhood.)

It was first described in 1853 by Dr. Little, but for a great many years small progress was made in its treatment. In orthopedic practice it ranks second only to infantile paralysis.

Etiologically it is divided into two classes: The congenital and acquired.

Paralysis of intrauterine origin may be the result (1) of prolonged labor or pressure of instruments, causing a subcortical hemorrhage or petechial hemorrhages in the cortex; (2) maldevelopment or secondary effects of intercurrent disease of the mother.

Acquired paralysis may be due to hemorrhage, embolism, thrombosis or disease. The symptoms are both motor and mental.

The effect of the lesion of the brain and the secondary changes in the anterior pyramidal tracts of the cord is to impair the voluntary control of the limbs supplied from the affected area and, at the same time, the inhibition of the higher centers is impaired or lost; thus, together with the loss of power, there is an exaggeration of the deep reflexes, causing a spastic rigidity of the limbs, varying with the degree of voluntary control.

The mental impairment varies with the degree of involvement, being more marked in the paraplegic and diplegic than in the hemiplegic form. It varies all the way from very slight impairment to complete idiocy.

Excessive deep reflexes are characteristic of the disease and it is important, if possible, to limit this excitement.

It may be conceded that the tension of a tendon is reflexly through

the spinal cord responsible for the tension of its muscle; that is to say there are nerve endings in the tendons which when excited send stimuli to the spinal cord and these are reflected to the muscles.

Now if the tendon of such a highly contracted muscle is divided, the stimulus abates, the reflex circle is broken, and the muscle ceases to be the seat of such tonic contraction. So, by doing a tenotomy you have relieved the paretic group of muscles from the constant pull of the opposing spastic muscles as well as relieving the spasticity of the tenotomized muscles. The motor impairment depends on the group or groups of muscles involved. In the lower extremities the muscles usually found spastic are the adductors of the thighs, the tensor vaginae femoris, the sartorius, the hamstrings and the soleus and gastrocnemius.

The mode of walking is quite typical; the patient progresses on his toes with the heels somewhat raised, the knees flexed and pressed together, the thighs rotated inward and the body thrown forward.

The muscles opposing the spastic ones, being often paretic to start with, become exhausted from resisting the constant pull. To relieve this several operations have been devised. One of these is to produce temporary paralysis by injecting the nerves supplying the spastic muscles with alcohol.

Stoffel's operation, which consists in cutting down on the nerve and dividing certain of the branches of distribution to the muscle itself or by cutting these in the main trunk of the nerves after identification by electric tests.

The one which gives the best results is perhaps that which consists

*Read before the Arizona State Medical Association at Prescott, May 14-16, 1922.

in tenotomies, tendon transplantation, the use of appliances and muscle re-education. In this the adductors are usually first dealt with. The skin being properly prepared, an incision one and one-half inches long is made on the inside of the adductor longus tendon and just below the fold of the groin. Through this incision the tendon of adductor longus brevis and gracilis are divided and the wound closed and sealed with collodion.

The sartorius, the tensor vaginæ femoris and iliotibial band are divided in the same way by the open method, as are also the hamstrings involved. The tendo achilles is lengthened by an L incision and sutured and the limbs are now adducted, straightened with the feet at right angles, and a suitable cast or other appliance applied to maintain this position.

At the end of about three months the splint or cast is taken off during the day and movements are practiced, being sure the appliances are worn at night to maintain the correct position.

In the upper extremity the surgical relief afforded is not as a rule as promising as in the lower extremity. The most pronounced deformities usually encountered are pronation of the forearm and flexion of the wrist. To correct this, gradual extension of the wrist may be brought about by the use of a metal splint in which the angle is gradually increased. If the forearm be merely semipronated this may be disregarded. It is not easy to give a reason for the improvement which ensues, but it may be taken as a fact that prolonged fixation of spastic muscles in a position opposed to their contraction gradually lessens the severity of the spasticity.

The treatment should extend over a period of at least twelve months, without any cessation day or night. The test for relaxation of the spastic muscles must be the return of power of voluntary movement of the paretic muscles.

As ability to extend the fingers occurs the splint is shortened to give support to the wrist only, leaving the fingers free for motion.

In certain cases in which success by this method is doubtful or progress unusually slow, operation on the forearm may be necessary. This operation usually consists in making a supinator out of the pronator radii teres and transplanting the flexors of the wrist into the extensors.

To convert the pronator radii teres into a supinator, the forearm is supinated to put the muscle on a stretch so that it may be identified and an incision is made two and one-half to three inches long along the inner margin of the supinator longus which is retracted outward, the artery and nerve identified and retracted inward and the pronator radii teres identified and its tendon, which is broad and flat, freed from its attachment to the radius with a goodly piece of the periosteum.

An aneurism needle is now passed through the interosseous membrane close to the radius, and worked up and down till a space of an inch or more has been made in the membrane. A hole is now drilled through the radius from front to back, a silk ligature is then threaded through the pronator tendon with its attached periosteum, drawn through the opening in the interosseous membrane and threaded through the hole in the radius; by so doing the pronator is attached to the radius from before backward and any contraction of it acts as a supinator.

To correct the flexion of the wrist the flexor carpi radialis is divided at its attachment, dissected upward for some distance, and re-attached to the extensor carpi radialis longior and brevior. The flexor carpi ulnaris divided at its attachment and inserted into the extensor carpi ulnaris.

The next stage in the treatment consists of educating and training the muscles of the limb after ten to fourteen days have been allowed to lapse for healing to take place. The move-

ments should at first be gentle, but after about six weeks vigorous movements may be practiced.

Great care must be exercised in the selection of the cases on whom operations are to be performed. In all cases in which the mentality of the patient is badly impaired it is a hopeless task to attempt to re-educate the transplanted muscles or sometimes to even educate these patients in the

use of the impaired muscles. Another feature which must not be lost sight of is if you cannot have these children directly under your care for at least a year you must have intelligent co-operation on the part of the parents or through the assistance of a trained nurse or your work will go for nothing and be another example held up to the laity of the uselessness of surgery.

X-RAY OF THE HEART*

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INTRODUCTION

Theoretically the X-ray examination of the heart is a comparatively simple undertaking and might be expected to produce invaluable results. Practically, however, an intimate familiarity with its normal X-ray appearance is necessary before one is able to interpret the cardiac silhouette. Unfortunately only the lateral portions of the heart are freely open to examination in direct sagittal projection, and, to the inexperienced, uncertainty arises in differentiating the cardiac shadow from the mediastinal contents and the diaphragm.

X-ray projection, being conical, produces a shadow of enlarged dimensions. Hence it is impossible to determine the size of the heart by direct measurement of its projected shadow, nor can necessary corrections be calculated accurately because thoraces vary in shape with variation in distance of the heart from a film in contact with the anterior chest wall. The teleroentgenogram taken with a target-film distance of seven feet approaches parallel projection, the examination is easily and quickly consummated and provides permanent radiographic record.

The fluoroscopic method of exam-

ination is relatively laborious, but its advantages are rapidly becoming recognized in America due to its perfection in France. It permits a study of the heart from all angles with accurate estimation of its size, shape, and motion.

The orthodiagram (See Fig. 1) was devised by Moritz in 1900, and may be easily improvised by slightly modifying any vertical fluoroscope. It is only essential that the roentgen tube, the screen and a recording point move simultaneously and that the beam of light used in observation is the central or perpendicular ray from

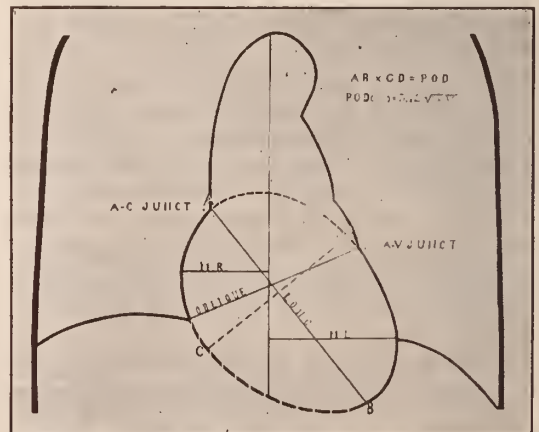


FIG. 1. Orthodiagram of Normal Heart*

*Read at the joint meeting of the Medical and Surgical Association of the Southwest and the Pacific Coast Roentgen Ray Society, at Phoenix, Arizona, December, 1921.

the target of the tube. The screen may be marked at the point of incidence of the central ray and the system is then moved until the marker corresponds to the point on the cardiac border which one wishes to record and a dot is made by the recording point. A line is marked by a series of dots which when subsequently connected accomplish a reproduction of linear outlines. Such a device produces the orthodiagram which is assumed to represent an image that is the exact size and shape of the cardiac silhouette.

Certain conventional diameters are constructed upon the orthodiagram. The midline is established by drawing a perpendicular equidistant from the chest walls. The MR (median right) is the line drawn from the midline to the most salient point on the right auricular border. The ML (median left) is the line drawn from the midline to the most salient point on the left ventricular border. The oblique diameter is drawn from the right auriculo-phrenic junction to the left auriculo-ventricular junction. The long diameter is drawn from the right auriculo-caval junction to the extreme apex. The point of most importance in the cardiac silhouette is the left auriculo-ventricular junction. This point cannot be determined from the film, but is easily determined before the screen as the lowest point of travel of the node of no motion, in other words, the point of rotation of the so-called walking beam phenomenon of the left border of the heart.

THE CARDIAC FORM

Roughly, we may say that the normal cardiac outline is represented by a series of curved lines. On the right side are two fairly broad curves, the lower one representing the border of the right auricle, and the upper, less well defined, representing in most cases, the right border of the superior vena cava, sometimes the right border of the ascending arch. The latter soon becomes lost in the mediastinal shadows, to reappear on the left side as a semi-circle repre-

senting the transverse portion of the arch. The left border of the descending arch may usually be distinguished as a straight line, approximately tangential to the shadow of the transverse arch. Immediately beneath the transverse arch one sees with greater or less distinctness, a curved line, convexity outwards, representing the ascending and transverse portion of the pulmonary arch. Its downward extension is in an almost straight line diverging slightly to the left and in some cases directly joining the left ventricle, which is the most conspicuous curve in the entire silhouette, running obliquely downward to the region of the apex beat and beyond, to disappear beneath the left diaphragm. Its exact relation to the diaphragm depends upon the habitus of the patient. In slim individuals and in quiet respiration the apex may be entirely free from the dome of the diaphragm. In most normal individuals it is almost entirely exposed on deep inspiration, while in those with a high diaphragm, particularly the obese, the left ventricular border may be interrupted above the point where it reaches its maximum distance from the midline.

Interposed between the pulmonary arc and the ventricular arc, in the majority of cases, one sees a short straight line which represents the left auricle. It can be recognized from the ventricular shadow by the time of its contraction, its lower limit being marked by the point of minimum excursion.

Van Zwaluwenburg's reductions of the changes in shape of the heart silhouette to a simple numerical expression has proved of extreme value. He pointed out in 1911 that the oblique diameter roughly corresponds to a dividing line between the auricles and ventricles, consequently the area above and to the right of this line can be considered an index of the auricular area, while that to the left and below represents the size of the ventricular portion of the heart. This relationship is expressed numerically by dividing the length of the auricu-

lar segment by the length of the ventricular segment of the long diameter, and is called the auriculo-ventricular (a-v) ratio, or the index of the heart. Normally it is approximately 0.55. With an increase in the auricular area its value rises. Relative increase in the ventricular size diminishes the index. While this index varies widely, depending upon the elevation of the diaphragm in normal subjects, and is disregarded in such cases except as an index to the posture of the heart, it is of great importance in the estimation of the relative size of the different chambers of pathological hearts where changes in posture are much less significant.

The examination of the patient in the right anterior oblique position as advocated by Vaquez and Bordet is of great practical value. Narrowing or obliteration of the upper third of the uniform clear strip which represents the posterior mediastinum signifies dilatation of the aortic arch; encroachment in the middle third means enlargement of the left auricle; and modification of the lower third spells enlargement of the right auricle, sometimes of the right ventricle.

The examination of the patient in the right posterior oblique position to determine the depth of the ventricles has proven of less uniform value in our hands in patients of widely different habitus such as make up our population.

With the data from these examinations at hand we can furnish the clinician a quantitative estimation of the qualitative valvular changes which he has determined by auscultation.

THE CARDIAC SIZE

It is notorious that percussion is frequently inaccurate in the estimation of the size of the heart.

Danzer in 1919 revived the so-called cardio-thoracic ratio as a means of estimating cardiac hypertrophy, which considers the heart definitely enlarged when its total transverse diameter exceeds one-half of the internal diameter of the chest.

In a series of one hundred cases recently studied in our laboratory, practically all the normal hearts with the exception of the visceroptotics show cardiac enlargement by this method. Naturally the method ignores variation in position of the diaphragm, and it would seem from our investigation that it is more accurately an index of the posture of the heart than of its size.

We have found the most simple and satisfactory method of estimating the area of the cardiac silhouette to be that of Van Zwaluwenburg, which computes the product of the long diameter and the transverse diameter, or greatest perpendicular to the long diameter which can be drawn in the closed cardiac outline (Fig. I).

In one hundred cases the area obtained in this manner showed an average variation of less than three per cent from the area computed by the most delicate instrument known to the engineering profession for determining the area of surfaces of irregular outline. The product so obtained is compared with a table of norms based upon body weight.

THE CARDIAC MOTION

We are often told by the clinician that he cares little about the actual size or shape of the heart, that the presence or absence of a valvular lesion is of little significance so long as the heart is doing its work; that the prognosis and treatment depend entirely upon the condition of the heart muscle.

From our experience in repeated roentgen observations of pathological hearts under treatment we are able to make fairly accurate estimations of how well the muscle is doing its work. We have seen dilated hearts come down from computed areas of 175 per cent to 120 per cent and have noted corresponding improvement in the density of the lower lung fields and in the shape and particularly the motion of the heart. Our roentgen examinations are made independent of any knowledge of the clinical examination and have checked closely

with the physical findings and the symptoms of the patient at the time. In fact, we have been able in certain instances to detect muscle failure twenty-four to forty-eight hours in advance of physical signs of dilatation.

Instantaneous radiographs of the heart have shown that the movement of no single border is an accurate index of its contraction and that the whole outline is necessary for such estimation. However, to the experienced observer much information is derived from the movement of the various sectors of the heart. One is first struck with the slight excursion to be seen anywhere on the cardiac border, and it is the general impression that the base of the heart is fixed and that the ventricular systole produces a wide retraction of the apex. However, the base of the heart is generally the least fixed portion of the organ, approaching the apex in greater degree than the apex approaches the base. The simultaneous filling of the auricles tends to prevent a reduction of the long diameter of the heart during ventricular systole. The lateral movement of the lower border being restricted by the diaphragm the only margin of the heart that is free to move is the left upper border, its motion being a shortening of the transverse diameter. Another factor to be considered is the movement of the heart as a whole and frequently the movement of a certain segment of the silhouette, as for example that sometimes seen in the left auricle in cases of auricular fibrillation and that commonly seen on the right auricular border represents not the intrinsic movement of that segment, but rather the transmitted motion of the organ as a whole.

Certain features of disturbed motion are, however, subject to fluoroscopic examination. In visceroptotics where the heart lacks the support of the diaphragm and is freely suspended from its attachment in the mediastinum to the deep fascias of the neck, the base is relatively fixed and the heart as a whole moves as a result

of the recoil from the expulsion of blood into the aorta. In the pathological heart one learns to recognize the disturbances of motion. The impulse may be excessive or insufficient or may give one the impression of being disorganized or lacking in co-ordination or purposefulness.

THE AORTA

Normally the aorta is not a conspicuous shadow, its lower right border is usually fairly well seen, but is soon lost in the shadow of the sternum. The transverse arch on the left is fairly prominent, but is all but hidden behind the sterno-clavicular articulation. On the screen the left lateral surface of the descending portion is usually obscured by the pulmonary and hilus shadows, but may be fairly well studied in the radiogram.

Age uncomplicated by hypertension causes an increase in the prominence of the arch throughout. Its density is increased and occasionally calcified plaques are noted in the portion if the wall which is viewed tangentially. It is not greatly widened, but strikingly increased in length, resulting in a greater prominence of the transverse arch and in a downward displacement of the base of the heart. The heart resting on the diaphragm consequently assumes a horizontal position. In arteriosclerosis the aorta approximates the senile type. In hypertension the arch may be slightly widened, the upper left segment prominent, with perhaps a slight increase in density. Lues shows an early tendency towards increased width of the aortic shadow, a common picture being that of an undue prominence just above the auriculo caval junction. Frequently the dilatation extends the entire length of the visible aorta. In such types of aortic change the pulsation is not excessive. Especially in the case of lues one notes a distinct reduction of the excursion. In rheumatic aortic insufficiency, on the other hand, the arch shows no appreciable dilatation, but a wide expansile excursion.

An outline of the diagnostic and salient features of the more common typical cardiac lesions as revealed by the fluoroscope and orthodiagram is given below.

MITRAL INSUFFICIENCY

The heart is round in shape. The area is enlarged, varying with the extent of regurgitation and secondary dilatation. There is an elevation of the auriculo caval junction, the apex is fairly well free from the diaphragm, there is a relatively long oblique diameter, the index is moderately increased from .6 to .8, the left auricle is conspicuous, the arch may appear shortened, the lower and middle thirds of the posterior mediastinum are narrowed or obliterated; the critical angle of rotation may be moderately increased.

MITRAL STENOSIS

The outline has the shape of a boxing glove. There is slight or no enlargement of the area. The index is high from .7 to 1.2. The right auricular border is fairly prominent. The auriculo caval junction is high. The posterior mediastinum is narrowed or obliterated in the middle third. There is not infrequently a prominence of the pulmonary arch.

AORTIC INSUFFICIENCY

This gives the prominent snub-nose or shoe-shaped cardiac silhouette. The involvement is almost purely of the left ventricular chamber. There is an increased long diameter. The left auricle either does not present or is relatively small. The right auricle is not prominent. There is an increased area and a reduced index. The apex is low and difficult to free from the diaphragm. There is a high critical angle of rotation and a clear posterior mediastinum. The arch is either of normal caliber with excessive excursion or it is wide particularly at its base and prominent just above the right auricle and is surprisingly quiet. The differentiation from hypertension is often difficult, from the fluoroscopic examination alone.

AORTIC STENOSIS

We are unfamiliar with the shadow in this condition. Cases referred to us as such have generally been senile hearts with markedly sclerotic arches.

CARDIAC HYPERTROPHY AND HYPERTENSION

The enlargement is almost purely left-sided, ventricular. Generally no change of index. There is an increased critical angle of rotation and a free posterior mediastinum. This condition is rarely seen until cardiac symptoms appear as a concomitant of dilatation and myocarditis which alters the picture as follows: The enlargement is more nearly symmetrical but still predominantly left sided until a late stage. The late stages give the largest areas on record. The arch may show little change, but is generally widened with reduced excursion and increased density. It is often difficult to differentiate this condition from aortic insufficiency, rarely from lues.

MYOCARDITIS

We divide this into two types, first, those without cardiac dilatation (a) senile type, (b) arteriosclerotic type (angina pectoris). Second, those with cardiac dilatation, (a) the end stage of practically every valvular disease, (b) the end stage of nutritional changes, (c) the end stage of toxic changes.

In cases of the senile type we see comparatively little enlargement. The position is transverse, usually considerably obscured by the dome of the diaphragm. There is an apparent lengthening of the arch with a prominent upper segment to the left. There is a low position of the auriculo caval junction. Occasionally we see associated senile emphysema and exaggerated bronchovascular shadows of the articulated type.

In myocardial degeneration with dilatation the area is increased, the outlines are variably altered. The shadow is obscured by a high diaphragm and not infrequently the increased density of adjoining lower lobes of the lungs. Often only en-

largement can be determined. The cardiac movements are disorganized and lack in purpose and effectiveness.

In myocarditis due to hyperthyroidism there is moderate or no enlargement, the heart is shapeless, flaccid, the pulsations are futile, the impulse is not well sustained, there is tachycardia and generally a substernal goitre.

CONGENITAL LESIONS

Our experience with this type of lesion is limited. At times we have been able to diagnose definite lesions which have agreed with clinical findings. In general it is not difficult to determine that a congenital lesion is present, though we are not always certain of its nature.

NEUROCIRCULATORY ASTHENIA OR IRRITABLE HEART

The few cases of this condition which we have seen have invariably shown hearts of small area, most generally of the drop type.

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THE RELATION OF NASAL AND ACCESSORY SINUS DISEASE TO BRONCHIAL ASTHMA*

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The fact that certain pathological conditions within the nose and accessory sinuses are frequently co-existent with bronchial asthma, and that they, in a fair percentage of the cases, have a direct bearing on the asthmatic attack, has been repeatedly noted by many observers.

In 1871 Votalini reported the removal of nasal polypi in a patient suffering from asthma. It was his opinion that "either the polypi reflexly produced the asthma, or these new formations in obstructing respiration altered its chemical processes and thereby the structure of the lung tissue."

About ten years later Fraenkel brought into prominence the frequently quoted nasal reflex neurosis theory. He considered asthma with nasal polyps in the light of a reflex spasm, localized in the bronchial muscles and produced by an irritation of the sensory nasal nerves.

Following Fraenkel's work, there were many contributions to the special literature, all having for their

theme some form of nasal disease, not only as the direct cause of asthma, but of many other diseases as well. This unbounded enthusiasm, which resulted in many unwarranted claims, served to bring the nasal reflex neurosis theory, for a time at least, into disrepute.

As applied to bronchial asthma, the nasal reflex theory suggests that, by irritation of the olfactory nerves, the nasal branches to the trigeminus or the sphenopalatine ganglion, there results a stimulation of the constricting fibres of the vagus, the phrenic or sympathetic, with resultant bronchial spasm.

Many of these writers have emphasized the reflex nature of asthma as related to intranasal and sinus disease. The evolution of this theory was largely the result of experimental investigation on animals.

Gording summarized the experiments of Sandmann, which were done for the purpose of the more minute study of the bronchial muscles. Sandmann, among others, stated that an

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irritation of the nasal mucous membrane in noncurarized animals caused in addition to the expiratory cessation of respiration, a narrowing of the air passages by contraction of the bronchial muscles. "In this way the protection of the respiratory organ against injurious influences is increased, and at the same time the removal of mucus from the bronchi and alveoli is greatly facilitated." He asserts, that by his experiments, he had established a physiological basis for asthma of nasal origin.

Dixon and Brodie found that, by intranasal irritation of the upper and posterior portion of the septum in decerebrated animals, they were able to produce contraction of the bronchial muscles. This reflex, however, ceased to appear after section of the vagus.

Certain intranasal areas are supposed to be more susceptible to the irritant than others. Hack has demonstrated sensitive spots on the anterior part of the lower and middle turbinates. Killian holds to the theory that the most markedly sensitive areas of the nasal cavity are to be found on the tubercle of the septum and on the anterior part of the inferior turbinate bones. He also makes the observation that the respiratory mucous membrane, with normal sensibility, does not give rise to reflex neurosis. Certain predisposing causes are necessary, and only when they are present can the neurosis occur.

In explaining asthma as a reflex from nasal disease, Sluder advances the hypothesis that the sympathetic nervous system is capable of transmitting afferent impulses which are not painful, sensory ones, because many patients with nasal asthma do not have pain of any kind." Since the sympathetic nervous system in the nose is derived from the nasal ganglion, the impulse may be traced from the inflamed nose by way of the nasal ganglion, the vidian nerve, the carotid plexus, the sympathetic trunk in the neck to the lower cervical and first thoracic ganglion, which are often united and frequently

spoken of as the stellate ganglion."

The same writer has had more success in the treatment of asthma and coincident nasal disease, where he has treated the posterior part of the nasal cavity, and he has also found that he can start asthma reflexes from this locality, i. e., from the nasal ganglion or the sphenoid sinus. Local inflammatory cases, which did not prove sensitive to proteins, received most relief from the control of the local lesions by surgery. Also, an autogenous vaccine proved helpful when bacteria from the lesion could be grown.

There is no denying that the respiratory center of the medulla can be stimulated by irritation, mechanical or otherwise, of the peripheral terminations of the trigeminus, which are distributed over the nasal mucous membrane. Coughing and sneezing are familiar examples of this reflex. Animal experimentation, by careful investigators, has demonstrated an intimate reflex association between the nerve supply of the nasal mucosa and that of the other parts of the respiratory tract.

Modern experimental medicine, however, has greatly altered our views in regard to many phases of asthma. The earlier conceptions that polypi, deviated septum, spurs or ridges, produced asthmatic attacks, as a result of mechanical irritation of sensory nasal nerves, has been largely superseded by more plausible theories. The general belief now is that nasal abnormalities are not fundamental causes, but rather contributory, inasmuch as they interfere with normal drainage, and thereby favor absorption of bacterial toxins or proteids.

We can recall two patients in whom attacks of asthma could be induced by irritating with a probe some of the more sensitive intranasal areas. Both had hyperplastic ethmoiditis. However, these observations would not warrant the conclusion that the attacks were the result of a nasal reflex, as both patients were decidedly neurotic. The psychic element in

these so-called reflex nasal asthmatics must not be overlooked. Cooke believes that many of these patients, as the result of repeated attacks from a specific protein, show a gradual development of what may be termed as asthmatic habit. He advances the theory that "repeated anaphylactic reactions in the mucous membrane and smooth muscle fibre of the bronchi seems to produce such an unstable equilibrium, and intense irritability, that they are reflexly affected by any stimulus in the domain of the extended vagus system, and these reflex paths become so established, and the instability so great, that any and all transitory and trivial stimuli produce great and prolonged effects, always translated, in these asthmatic cases into terms of bronchial contraction and congestion."

With our present knowledge of protein sensitization, the manner in which nasal diseases may be causative factors in the production of asthma, has given rise to much discussion as to the probability of their being in some way connected with the phenomena of anaphylaxis.

In 1910 Meltzer suggested the relationship between asthma and anaphylaxis. He based his theory on the fact that a complete clinical analogy exists between the phenomenon of bronchial asthma and that produced experimentally in animals. Meltzer's observations are in accord with those of other investigators.

Sewall demonstrated that previously sensitized guinea pigs may react to intranasal instillation of horse serum, and develop typical attacks of bronchial asthma.

Summarizing the findings of certain experiments in animal anaphylaxis, Walker concludes that a foreign protein applied in the upper respiratory tract of a sensitized animal irritates the constrictor fibres of the vagus, producing a stenosis of the smaller bronchi, by causing a spasm of their circular muscles. This he believes to be the mechanism of a typical attack of bronchial asthma.

It has been assumed by several

writers that the protein is derived from the disintegration of the mucoid or purulent secretion found in the nose or accessory sinuses. The intranasal changes occurring in an asthmatic attack, viz., turbinal turgescence, hyperplasia of the nasal mucous membrane, and resultant mucoid secretion and nasal stenosis, have been suggested as part of the clinical picture of an anaphylaxis.

Adequate proof of the first statement is still wanting. The vasomotor changes alluded to in the second statement, however, are matters of every-day clinical knowledge. On the other hand, the truth of this observation offers a very poor premise upon which to base any definite conclusion as to the beneficial results that will follow intranasal surgery, in the case of asthmatics allergic to a foreign protein. It is the protein element, and not the bacterial toxin or infectious element, that is essential for the production of an anaphylaxis. To theorize that a bacterial infection may, in some mysterious manner other than by the action of its protein, be accountable for these nasal vasomotor changes, is not in accord with well-authenticated, experimental and clinical data. One of the most notable accomplishments of comparatively recent experimental medicine is the rescue of vasomotor rhinitis and asthma from the nebulous province of vague speculation. It must be admitted that they now have been placed upon a sound and definite, if not wholly complete, etiologic and therapeutic basis.

Walker, Cooke, and other workers in this field, have demonstrated that about fifty per cent of patients with true bronchial asthma are sensitive to foreign proteins of some sort, viz., pollens, foods, epidermis of animals, or bacteria. In Walker's series, ten per cent of the total number studied were found sensitive to various bacterial proteins. He thinks any type of bacterial protein may cause bronchial asthma. There is still another fifty per cent which are non-sensitive. These are classed as non-anaphylac-

tic, and belong to the asthmatic bronchitis type. In the non-sensitive group he finds forty-six per cent relieved of their asthma, and sixteen per cent greatly improved by treatment with vaccines. Obviously, those cases belonging to the bacterial protein group (which form a comparatively very small number) and those of the non-anaphylactic group would be most amenable to relief, following removal of indicated foci of infection. Our own experience has been that the type of asthmatic in whom the best results might be expected from treatment directed to the nose or sinuses, belongs to the non-sensitive group. Two of our patients with seasonal hay fever, who suffered with asthma throughout the year, were benefited by correcting abnormal nasal conditions. The relief afforded, however, could be attributed to the elimination of a superimposed bacterial infection.

Of the pathological intranasal conditions that are found in asthmatics, hyperplastic ethmoiditis is the most frequent. This is characterized by inflammatory changes of the mucosa lining the ethmoidal cells, which often results in the formation of polypi. The polypoid growths may be hidden within the cells, or may protrude from the cell ostia and fill the entire nasal cavity.

There seems to be some unexplained relationship between the occurrence of nasal polypi and asthma. In a series of twenty-eight of our cases, twenty-one showed well-defined pathological changes in the ethmoids. Only two suffered from a purulent ethmoiditis. The comparative infrequency of this form of the disease in asthma might be explained by the fact that ethmoidal empyema is more often of the open than the closed type, and thereby conditions are rendered less favorable to protein absorption. There was chronic antral empyema in three cases, and one case of unilateral pansinusitis. Four of the ethmoidal cases were complicated by markedly deviated septa. In the polypoid cases, com-

plete exenteration of the ethmoidal cells was done. Removal of polyps alone in these cases is useless. Occasionally, although a most thorough operation has been done, there is apt to be a recurrence. Following operations autogenous vaccines, made from the sputum and nasal secretions, were employed in several of these cases with good results. The infected sinuses were opened and drained. Observations were made over periods of from one to three years, and earlier conclusions checked, as far as possible. The results were as follows: Four patients were completely relieved of their asthma, and ten showed decided benefit, both the number and severity of their attacks being very much lessened. Six cases were not improved, and the final outcome of the remaining eight could not be determined.

CONCLUSIONS

1. The fact that chronic infection of the nose and paranasal sinuses is of frequent occurrence in bronchial asthma is well established by clinical experience.

2. In cases found sensitized to foreign proteins, the surgical treatment of pathological conditions will result in benefit only inasmuch as they are accompanied by properly directed measures towards desensitization or the removal of the allergic element.

3. There are a small number of cases, that is, those sensitized to bacterial proteins, and a greater number, viz., those belonging to the non-sensitive group, in which the more favorable may be looked for by attention to the nose or sinuses.

4. In all cases of bronchial asthma skin tests should be done, in order to determine whether or not they have a protein sensitization as their basis.

5. In many cases of asthma we must reckon with an underlying bronchitis as an etiologic factor.

6. As the upper respiratory tract offers the most accessible route for bacterial infection to the bronchial

tree, the relief afforded can be attributed to the removal of infected foci which tend to keep up the continued bronchial infection.

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THE VALUE OF BLOOD CHEMISTRY TO THE PRACTITIONER*

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Chemistry plays a role of ever-increasing importance in the general practice of medicine, while in the field of metabolism, specifically, it has become almost the alpha and omega. We have long known much regarding the etiology of diseases and still more of their pathology, the end results, so to speak, but, as regards the chemistry of their development and subsequent progress, there has been a lamentable paucity of accurate, definite knowledge until comparatively recent times. Particularly is this true of the so-called endogenous diseases, those of metabolism, and it is fortunate indeed that it is this group precisely that the most satisfactory results have been latterly obtained along chemical lines of investigation. Numerous metabolic alterations, notably the elimination of the katabolic products, are now definitely determinable by laboratory methods.. No matter how divergent may be the views held upon points such as the technical interpretation of results, or consideration of what constitutes the normal, it is undeniably true that the findings obtained in pathological conditions have attained positions of high value as indicators of the nature of the metabolic disturbances resulting in abnormal production or faults in elimination of the waste products of the body.

Medical chemistry deals largely, if not exclusively, with the study of the body fluids and gases. Of these, it was but natural that the urine, because of its ready accessibility, should have been subjected to the greatest amount of investigation in former years or indeed until very lately. For example, Thomas and Birdsall¹ in 1917 in an exhaustive review tabulated no less than forty-five tests for kidney function as applied to the urine, about equally divided in number with reference to the viewpoint of elimination and retention of waste products. Perhaps no better proof could be advanced as to the inadequacy of the urine to correctly outline the metabolic picture than the very multiplicity of the criteria advanced from time to time for the evaluation of its constituents. However, there is a deeper reason, more practical and of infinitely greater scientific import, to be found in the fact that the urine being an excretory product shows primarily, if not indeed exclusively, what substances only, or their amounts, which are being cast out of the body and not with any degree of certainty what factors, either qualitatively or quantitatively, are being retained in the blood or the general economy. It is precisely this matter of retention that is of the utmost importance to the patient as re-

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gards his life expectancy and to the physician engaged in diagnosis, treatment and prognosis of the suspected metabolic disorder. Hence, without in the least decrying the importance of making a beginning study of the chemistry of the urine, it is the investigation of the chemistry of the blood that has during the past decade brought us much nearer the elucidation of many clinical problems.

Reliable data on the chemical composition of the blood, both in health and disease, are primarily the result of American observation with American methods. The names of Folin, Benedict, Van Slyke and Victor Meyers are among those to whom our debt of gratitude is largely due in this connection and it should be a source of gratification that there is no "Made-in-Germany" tag or other foreign label upon most of the discoveries and progressive achievements of modern blood chemistry.

In so brief an outline as this, it is possible to consider only a few of the chemical observations which have served most practically and helpfully as guides to the diagnosis and treatment of every-day pathological prob-

lems, yet it may not be amiss to merely bound the field covered by present-day blood chemical research. There are included in this domain accurate laboratory methods for the appraisal of the total blood volume, the blood proteins (serum albumin and globulin), and improved devices for percentage of hemoglobin; the estimation of the total non-protein nitrogen and its individual components (urea, uric acid, creatinine, amino acids, creatin and ammonia); the determination of a dozen mineral constituents ranging from sulphates and chlorides to iron, the lipid elements such as fat, lecithin and cholesterol; the measurement of blood gases, to-wit, carbon dioxide, carbon monoxide and oxygen, with valuation of the hydrogen ion concentration; the quantitative gauging of sugar, acetone bodies and phenol; and finally of enzymes like diastase, lipase and catylase. Before discussing the pathological variations of some of these factors which have been found most useful to the clinician in every-day practice, it is well to bear in mind the generally accepted normal range of such substances.

TABLE 1.

BLOOD VALUES

Substance	Normal	Serious Increase	Extremes Recorded
Total Non-Protein Nitrogen	25 to 30 mg.	80 mg.	300 mg.
Urea Nitrogen	12 to 15 mg.	50 mg.	250 mg.
Uric Acid	1.5 to 3 mg.	7 mg.	10 mg.
Creatinine	1.0 to 2.5 mg.	3.5 mg.	10 mg.
Glucose	0.06 to 0.12%	0.4%	0.8 to 1.0%
Cholesterol	0.15 to 0.2%	0.5%	0.9%
Chlorides as Na Cl	0.45 to 0.60%	Above 0.60%	0.8%
Carbon Dioxide			
Combining Power	73 to 53 c.c.	40 to 31 c.c.	16 c.c.
Alkali Reserve of			
Blood Plasma	RpH 8.5 to 8	RpH 7.7	RpH 7.

...THE TOTAL NON-PROTEIN NITROGEN of the blood is about 1 per cent of the nitrogen therein contained and is principally made up of urea nitrogen, uric acid and creatinine. It is well to remember that urea is largely exogenous in origin, creatinine almost entirely of endogenous formation, with uric acid occupying an intermediate position, urea being formed mostly in the liver from ammonia set free in digestion, but not of immediate use to the organism, uric acid originating as a result of enzymatic and glandular activity and creatine apparently formed in the muscle tissue. The total non-protein nitrogen of the blood is practically always increased in any disturbance of kidney function and varies from the high normal of 30 mg. per 100 c.c. to 50 mg. or thereabouts in early interstitial nephritis and finally to the massive figure of 300-350 mg. per 100 c.c. in terminal interstitial nephritis with uremia. This estimation forms, therefore, a most valuable single test for impairment of elimination by the kidney. A closer study of each of the three principal non-protein nitrogen functions, viz., urea, uric acid and creatinine, will give yet more fruitful information for a close differential diagnosis or accurate prognosis.

Urea, by the selective action of the kidney, is maintained at a level of about 50 per cent of the total non-protein nitrogen of the blood and any impairment whatsoever of renal function will hence result in positive, measureable increase of urea nitrogen. Increase of blood urea nitrogen will occur not alone in chronic interstitial nephritis, terminal stage (75-300 mg.) and uremia (350 mg.), but likewise in some cases of acute nephritis and polycystic kidney (50 to 75 mg.), in bichloride poisoning (240 mg.), malignancy (58-60 mg.), pneumonia (46-50 mg.), intestinal obstruction (44 mg.), lead poisoning, syphilis and cardiac disorders with renal involvement. Advanced diabetes, either from administration of a high protein diet or a complicating nephritis, often gives high figures for urea.

In eclampsia, contrary to old-fashioned conceptions, which in some mysterious way affiliated this syndrome with uremic poisoning, we find that there is slight, if any, elevation of urea and a normal pregnancy even shows "subnormal" urea findings. The blood urea has still another function as a valuable preoperative prognostic test, especially in prospective prostatectomy, cases showing 20 mg. per 100 c.c. being regarded as good operative risks, but figures over 30 mg. affording a poor operative prognosis. In parenchymatous nephritis, contrary to the interstitial variety, the blood urea is relatively low (20 to 50 mg.), the retention of chlorides being an equally important factor as compared with urea retention in nephrosis.

As regards the retention of *Uric Acid* in the system, we know that this ingredient is the least soluble of any of the three principal non-protein fractions. Hence, it is not surprising that high values for uric acid are found not only in the later stages of chronic interstitial nephritis, but in the very early stages of this disease before either urea or creatine are unduly retained, thus furnishing, when the possibility of gout is absent, a valuable and early diagnostic sign not infrequently preceding the finding of either albumin or casts in the urine. Gout itself is almost invariably associated with an increased uric acid content of the blood (6.0 to 9.5 mg.) being found, and the differentiation of this disease from arthritis, with figures of 1.6 to 3.6 mg., can be readily accomplished by this estimation unless the arthritis, as is infrequently the case, happens to be complicated by nephritis, under which circumstances the accompanying increase in urea and total non-protein nitrogen should prevent confusion. Creatinine, normally nearer 1 m. than 2 mg., is usually the most readily eliminated of any of the three principal nitrogenous waste products and, therefore, an appreciable retention of creatinine, i. e., 4 mg., does not occur until the activity of the kidney is greatly

impaired and considerable retention of urea and to a lesser extent of uric acid has already taken place. Moreover, those cases of chronic nephritis in which creatinine has risen above 5 mg. per 100 c.c. rarely show improvement, and, in fact, almost invariably die soon after; thus affording a valuable prognostic criterion, since it appears that the kidney is never able to overcome the handicap of a high creatinine accumulation.

The question of decreased kidney function or renal impairment is frequently linked with that of cardiac or vascular diseases so that the kidney is not alone to be considered, but even in cases thus complicated or involved the estimation of the non-protein nitrogen factors is of value just the same. Williams² in a lengthy series of cases and experiments, summarizes this question as follows:

1. Chronic nephritis with hypertension and uremia is characterized by a marked increase in non-protein nitrogen substances in blood, more particularly of uric acid.
2. Cardiac insufficiency without nephritis is associated with moderate retention of non-protein substances in blood, more particularly of uric acid.
3. In chronic nephritis, with clinical and anatomic evidence of disease, there is always nitrogen retention and renal insufficiency.
4. Chronic nephritis of moderate degree with hypertension is associated with moderate increase in waste nitrogen and lessened kidney function.
5. Presence of albumin and casts in the urine is not necessarily diagnostic of nephritis nor is their absence necessarily indicative of the non existence of such disease.
6. Improvement of the circulatory disturbance is accompanied by a decrease in the various nitrogenous extractives of the blood, more particularly the uric acid, and this may suggest that, at least, a part of the damage done the kidneys is a sequence of the alterations in its nutrition brought about by passive hyperemia.

THE SUGAR OR GLUCOSE of the blood is normally 0.06 per cent to 0.12 per cent. The excretion of sugar by the kidney has been well likened to the safety valve of a steam boiler, and the real condition to which attention should be directed is the possible excess of sugar in the blood (hyperglycemia) rather than sugar in the urine in excess (glycosuria, or more properly glycuressis). Especially will

this be clear when it is remembered that during the advance of a case of diabetes mellitus the measure of the sugar in the urine becomes gradually a less and less safe index of the patient's condition, and consequent guide to treatment, since the permeability of the kidneys becomes lowered or the "threshold point" for sugar raised. Thus in early cases of diabetes, one may note an excretion of sugar in the urine when the blood sugar has risen to a point, let us say, of 0.16 per cent, but in advanced cases, most often complicated with nephritis symptoms, blood sugar values of 0.2 per cent to 0.3 per cent or higher may be noted without the appearance of any glycuressis. In the matter of the treatment of diabetics, therefore, it is highly desirable to maintain the blood sugar level, which is ascertainable only by periodic routine examination of the blood, as nearly at a normal figure as possible even though severe dietary restrictions are required, since, in many cases, the acquired high sugar threshold will permit a dangerously liberal diet without the appearance of sugar in the urine. The following case is illustrative of the value to both patient and physician of such regular examinations, as a control of the diet:

C. W. W. (Case of Dr. G. W. Purcell, Tucson, Ariz.) Male, age 40, occupation, tire salesman. Family history unimportant. Personal history negative up to May, 1921, when he contracted pertussis from his daughter and showed bona fide "whoop" for several weeks. In January, 1922, he consulted a physician because of frequent urination and thirst and sugar was found in the urine. April 18th, he consulted Dr. Purcell, at which time his weight had decreased from 160 lbs. to 126 lbs. The urine amounted to 2200 c.c. for 24 hours, Sp. Gr. 1040 and showed 10% sugar by titration with Benedict's Solution. The glucose content of the blood on this date was 0.375%. Upon starvation diet for 48 hours, the thirst and frequency of urination ceased and the sugar of the urine fell to 0.2%. He was put upon 5% carbohydrate diet and in two days the urinary findings were: 24 hour total 1260 c.c., sugar 0.14%, Sp. Gr. 1016 and blood sugar had dropped to 0.16%. The physical examination showed nothing abnormal in heart, lungs or abdomen; Wassermann negative; blood pressure, systolic 130, diastolic 85. He has remained continuously on the 5% car-

bohydrate diet ever since and, while he has gained no weight, he looks and feels well. The weekly examinations of the urine have invariably given values between 0.08% to 0.2 sugar, Sp. Gr. never exceeding 1026, a trace of acetone upon one occasion but never diacetic acid or albumin. His monthly blood examination on May 26th gave glucose content of 0.086%.

Those who may be skeptical or timorous as regards undernutrition on low carbohydrate or starvation diets in diabetes mellitus should bear in mind a recent positive assertion of Allen³ that clinical evidence to date shows that by sufficiently thorough dietary control the downward progress of most cases of diabetes is either halted or almost indefinitely delayed. And Joslin⁴ stated lately before the New York Academy of Medicine, "There are few diabetic patients starving themselves to death from not eating, but there are many who are starving themselves to death while eating too much by voiding pounds of sugar in the urine. Many of these escape actual death by starvation only because they die prematurely of coma." The routine examination of the glucose content of the blood is the one sure method of gauging the regulation of the diet, comparatively checking the minimum excretion of sugar in the urine and furnishing the warning signal far preceding the advent of coma. Concerning so-called renal diabetes (which presents the symptoms of low-grade glycosuria, probably with proteinuria, but lacking the constitutional symptoms of diabetes mellitus), the diagnostic signboard is the absence of excess sugar in the blood, since diabetes mellitus is invariably accompanied by hyperglycemia. The development of an accurate means for the estimation of blood sugar has also made possible tests for carbohydrate tolerance on a basis of practicability and value. This procedure consists of a series of blood sugar determinations following the ingestion of a measured amount of glucose showing what is known as the sugar tolerance curve. This peculiar type of curve is noted by Friedenwald and Grove⁵ in many cases of gastrointestinal cancer and car-

cinoma where carbohydrate metabolism is disturbed probably in the opinion of Langston⁶ by a secretion of the tumor cells. This same type of curve is found in many cases of tuberculosis⁷, also in some staphylococcus and streptococcus infections⁸, and always in diabetes mellitus and hyperthyroidism. In endocrine conditions generally the blood ratio always varies directly with the activity of the thyroid gland and low values are hence found in myxedema and cretinism. Hypoglycemia is also the rule in Addison's disease, due to disturbance of the adrenals, but high values in acromegaly are obtained when the hypertrophy of the pituitary acts as an accelerator of carbohydrate metabolism.

In close connection with the subject of blood sugar is the condition called acidosis, inasmuch as this term was originally coined by Naunyn to apply to the ketosis of diabetes. Later knowledge has shown, however, that acidosis may result either from an abnormal formation of acid substances such as is found in diabetes or from a decreased elimination of normally formed substances as in nephritis or the retention of acid phosphate as in infantile diarrheas. There are a number of different criteria for measurement of the degree of acidosis, but the carbon dioxide combining power and the alkali reserve of the blood plasma are regarded as most valuable, the latter, because of greater technical ease of accomplishment, being possibly less likely to error while fully accurate for all clinical purposes and hence preferable. Normal values range from 53 to 73 c.c. of carbon dioxide to 100 c.c. of blood plasma for the former method and an arbitrary expression known as R_pH 8.0 to R_pH 8.5 for the latter in terms of hydrogen ion concentration.

CHOLESTEROL is found normally in the human blood in the proportions of 0.15 per cent to 0.2 per cent. Hypercholesteremia occurs in arteriosclerosis (0.23 per cent), nephritis (0.22 per cent, diabetes, especially when

accompanied by acidosis (0.34 per cent to 0.82 per cent, obstructive jaundice (0.29 per cent), in many cases of cholelithiasis, in the early stages of malignant tumors (0.20 per cent), pellagra (0.24 per cent), and in pregnancy from the fourth month until at least the middle of the postpartum period (0.23 per cent). The chief condition in which low cholesterol values are noted is anemia (0.07 per cent), and when the anti-hemolytic action of cholesterol is called to mind the deficiency of this substance may be seen to have possible practical significance.

THE CHLORIDE CONTENT of the blood, normally 0.45 to 0.50 per cent in terms of sodium chloride, has been well understood longer than any other blood constituent which has been mentioned in detail, but its practical value is probably not nearly so great as the others. The blood chlorides are increased in nephritis (0.55-0.60 per cent), especially of the parenchymatous variety, in pernicious anemia (0.51-0.60 per cent), in some cases of malignancy (0.55 per cent), and certain cardiac conditions, while on the other hand, low figures are found in fevers, diabetes (0.35 per cent), and pneumonia (0.35 per cent). As regards nephritis, the excretion of chlorides and of nitrogen seem to be fairly independent functions. In parenchymatous nephritis, the chloride elimination is much more affected than that of the nitrogenous waste products, while, by contrast, the reverse is the case in nephritis of purely interstitial type as we have seen under non-protein nitrogen.

Much has been written to date on the subject of blood chemistry, many divergent views expressed from time to time, so that to some extent the clinician has been at sea in regard to the actual value of such procedures in the daily practice of medicine. However, the values and determinations which have been sketchily outlined in the foregoing are bearing nobly the tests of time and experience and proving constantly to those who avail themselves of this knowledge their

practical applicability to problems encountered each day. One must perforce accept the results of chemical examinations of the blood as one more link in the chain of evidence leading to the discovery of the actual seat of any disturbance in the body. But let it be said that a blood chemical result is never found to be the weakest link and not infrequently is it eventually discovered or acknowledged to be the missing link or final bond which lengthens the chain sufficiently to lift the problems from the depths of uncertainty to the broad, safe level of an accurate anatomic diagnosis and to permit of rational therapy and an understanding prognosis.

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AMERICAN ROENTGEN RAY SOCIETY: Among the roentgenologists who attended the annual meeting of the American Roentgen Ray Society, in Los Angeles, Sept. 12-16, were Drs. H. L. Goss, Will Wilkinson and W. Warner Watkins, of Phoenix; H. D. Ketcherside, of Yuma. Dr. Metzger of Tucson and Dr. Couch, of Phoenix, were also in attendance at this meeting.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE: The Southwestern Division of the A. A. A. S. met in Santa Fe, N. M., September 6th to 9th. The Chairman of the Executive Committee, Dr. E. C. Prentiss, of El Paso, reports a very fine program and an excellent attendance. The local arrangements were perfect and the entertainment not to be surpassed.

The new officers of the Division are: Dr. V. M. Slipper, Director of the Lowell Observatory, Flagstaff, Arizona, President; Prof. Howard Estill, University of Arizona, Secretary-Treasurer. The time and place of the next meeting were not decided upon.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

DR. KELVIN D. LYNCH, Mills Building, El Paso, TexasEditor in Chief.
DR. PAUL GALLAGHER, Mills Building, El Paso, Texas.....Associate Editor
DR J. W. ELDER, Albuquerque, New Mexico.....Associate Editor
DR. W. WARNER WATKINS, Box 1328, Phoenix, ArizonaManaging Editor

MEDICAL AND SURGICAL ASSOCIATION OF THE SOUTHWEST

The eighth annual meeting of this Association is to be held in El Paso, early in December. The program is already in process of arrangement, with Dr. H. H. Stark, of El Paso, Chairman of the Program Committee. All papers which are to be presented before this meeting must go through the hands of the Chairman of the Program Committee, or come through some member of the committee.

A custom which has become a rule, practically, is that the entertaining Society (in this instance, the El Paso County Society), shall devote its energies to the clinical portion of the program, allowing all places on the scientific program of papers to be filled by outside members, or invited guests. These guests are to be invited by the Chairman of the Program Committee.

Several important matters are to be discussed and decided at the El Paso meeting. One of these will be a proposed amendment enlarging the territory from which members will be received.

At present, members are received only from Arizona, New Mexico, Texas west of the Pecos River, and from Northern Old Mexico. The proposed amendment would permit members to

be received from Southern California, Colorado and elsewhere in Texas. The advantages and disadvantages of this change will be discussed at the forthcoming meeting.

The usual elaborate entertainment which the El Paso men always provide, will, no doubt, be forthcoming, and the program which is in process of preparation, will be the best ever yet offered by the Association.

DR. W. G. RANDELL

The tragic death of Dr. W. G. Randell, of Florence, as recorded in the daily newspapers, brought sorrow to a host of friends in his own and neighboring counties. Dr. Randell was a member of the Maricopa County Medical Society, which organization sent a delegation to Florence to attend the funeral services.

Years ago, when Dr. Randell first came to Phoenix seeking restoration to health, he made many friends among the medical men of that city, and his association with the Society, during the years of practice in Florence, maintained the friendships earlier formed. His excellent professional work in Florence, first in connection with the prison reform work initiated by Governor Hunt, and later in the County Hospital, will long be remembered.

DOCTORS AND INVESTMENTS

The reason most doctors have so little money to invest in profitable ways is because they waste so much in "wild cat" schemes. The doctor is the exemplification of the "hayseed", so dear to the heart of the bunco man. It was estimated that more than a million dollars went out of a city of about 40,000 people, in the Southwest, in the Texas oil fields, in 1920—never to return. It is known, certainly, that at least fifty thousand dollars of this came out of the pockets of the doctors of that city. This against the advice of bankers and all well informed and reputable financial representatives.

In contrast, a doctor is known to us who says that he never invests in anything except bonds of banks or those recommended by reputable banks; this doctor recently retired from practice, at the age of forty-five, with sufficient income to support himself and wife for life.

The lesson is plain. When you invest, KNOW what you are purchasing. If you wish to gamble, play the races or sit in a poker game, losing what you can afford to lose. Your money to be invested can be invested safely. If you do not know the risks in a proposed investment, inquire of a reputable investment concern, who will give you the facts.

A "HEALTHY" TENDENCY

The chief weakness of every effort made by the medical profession to bring about conditions which will improve the public health has been our inability to enlist the active co-operation and support of educated people, even when they realize that the object sought is a very desirable one. If a man has had no part in initiating a movement, it is difficult to interest him in it, after it is started, unless it touches him personally.

An organization recently started in England aims to overcome this difficulty by bringing into one body, corporations, associations, societies and individuals whose activities are, in any way, such as make the matter of

"health" a concern to them. The corporate members include societies representing dentistry, veterinary medicine, pharmaceutical chemistry, nursing, radiography, midwifery, massage and medical gymnastics. Lay organizations representing commercial and industrial interests, voluntary health work, industrial welfare, and insured persons. Individual members include members of the House of Lords, ten medical and a number of other members of the House of Commons, mayors, county councilors, many distinguished members of the medical and allied professions, prominent business men and social workers.

The organization goes by the name of "The Federation of Medical and Allied Sciences." It issues a monthly publication called "Health." The first president is Sir Berkeley Moynihan.

There is a ripe field for an organization of this character, whose chief aim is the betterment of the public health, and whose activities will be directed to this end alone.

DR. ALEXANDER R. CRAIG

This familiar name will no longer appear upon the hundreds of thousands of letters received by the doctors of the country, the signature representing to them their personal touch with the American Medical Association. No longer will we see the genial, courteous and unassuming personality at the annual meetings, or in the office at Chicago. Alexander Craig's work was cut short by pneumonia a few weeks ago, and upwards of two hundred thousand physicians were shocked by his sudden death. Who can take his place,—many have asked? Some one, no doubt, will be able to take up his well-organized work and continue it, but no one can ever take the place he built for himself in the hearts of his confreres and professional friends. Many powerful personalities in the Association have made enemies, but A. R. Craig appeared to be able to make only friends. We join the entire profession of the country in mourning a great loss.

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GILA COUNTY MEDICAL SOCIETY

The County Society of Gila County was called together for a special meeting, Friday evening, September 22nd, the occasion being the opportunity of hearing Dr. B. H. Orndoff, of Chicago, in an address on "Pneumoperitoneum in Diagnosis and Therapy." Dr. Orndoff was making a trip through Arizona, as the guest of Dr. Watkins, of Phoenix, and when it was learned that he would pass through Globe, the Society was called together to avail themselves of the opportunity of hearing this address. Every member of the Society was present, except two, who were absent from the city, one who was ill and one who was compelled to remain on duty at the Miami-Inspiration dispensary. Dr. Swackhamer, of Superior, Dr. Stratton and Dr. Sawyer, of Graham County, were also present.

After a dinner at the Old Dominion Hotel, Dr. Orndoff spoke for an hour and a half on the subject mentioned, including also a description of the method of peritoneoscopy—originated by the speaker—by means of which a direct observation of the peritoneum through a lamp and lens system, is made.

EL PASO COUNTY MEDICAL SOCIETY

At a special called meeting of the El Paso County Medical Society, held July 31, 1922, convened for the purpose of discussing the appointment of a full time Health Officer for El Paso as a part of the re-organization of the City Health Department, a committee previously appointed to investigate the matter reported as follows: After free discussion with various civic bodies it had been decided to recommend that the Health and Sanitary Departments be separated and that a physician be appointed as a full time Health Officer, the selection to be made of someone fully qualified.

In accordance with a resolution embodying this recommendation and presented to the City Council, that body recently appointed Dr. John W. Brown, a member of the El Paso County Society, to the position. Dr. Brown will work under the supervision of Mr. R. E. Tarbett, U. S. Public Health Service, until the re-organization of the City Health Department is completed. Mr. Tarbett being engaged in that work at present. Dr. Brown was, previous to his appointment, acting as Assistant Health Officer and previous to his coming to El Paso, two years ago, gained considerable experience in health work in his work in the army along sanitary lines.

The El Paso County Medical Society met for the first regular meeting after the summer vacation on September 5th with 42 members and 15 visitors present.

The entire program of the evening consisted of a presentation by lecture and diagram of a properly organized city health department

by Major R. E. Tarbett, U. S. P. H. S., who is now supervising the reorganization of the El Paso Health Department. He stated that in his opinion, the health department should be divided into two sections, a medical, having supervision over purely medical matters such as communicable disease control, public health nursing, school inspection, etc.; and a sanitary section, having control over all sanitary matters. He advocated a physician and a sanitary engineer in charge of these sections respectively.

By far the most freely discussed question that has come before the medical society in some time was that of pasteurization of the city milk supply below the certified grade which has been advocated by Major Tarbett and which he desired thrashed out before the society and dairymen present as visitors. At the end of a rather heated two-hour discussion, the question stood with apparently the majority of the physicians for the measure and a majority of the dairymen against it. The society took no official action.

Dr. J. W. Brown, the newly appointed full time City Health Officer, presented an outline of the proposed new free clinic.

The membership of Dr. S. D. Armistead was transferred from the Baldwin County (Alabama) Society and that of Dr. G. E. Tucker was transferred from the Perry County (Arkansas) Society.

NAVAJO COUNTY: Dr. W. P. Sampson, of Winslow, was in Phoenix during the last week of September, attending the Democratic convention.

BOOK REVIEW

DISEASES OF THE DIGESTIVE ORGANS, *with special reference to their Diagnosis and Treatment*, by Charles D. Aaron, Sc., M. D., F. A. C. P. Professor of Gastroenterology and Diabetes in the Detroit College of Medicine & Surgery, Consulting gastroenterologist to the Harper Hospital. Third Edition, thoroughly revised. Illustrated with 164 engravings, 48 roentgenograms and 13 colored plates. Lea and Febiger: Philadelphia and New York, 1921. Price, cloth net \$10.00.

Diseases of the Digestive Organs, Diagnosis and Treatment, third revised edition, by Aaron, is a contribution of merit. The newer methods of diagnosis and treatment are brought together in this one volume in clear and condensed form. In many cases the author has sifted the chaff from the wheat in such a way that the practitioner can profit from his experience.

The reviewer can heartily recommend this book as representing the latest and best in the science of gastro-enterology. F. D. G.



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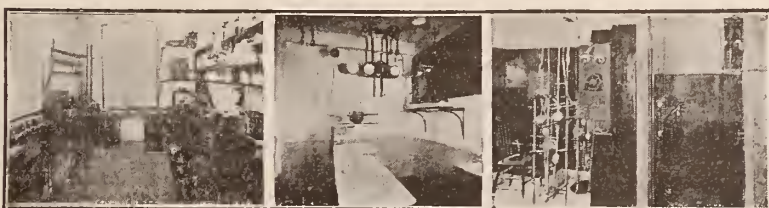
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DELAYED BOWEL MOVEMENT TYPE OF CONSTIPATION*

ERNEST CLYDE FISHBAUGH, M.A., M. D., Los Angeles, California.

During a careful study of four hundred and thirty-seven private patients with symptoms evidently due to chronic constipation twenty-one, or about five per cent, were encountered who gave histories of absolutely regular daily bowel movements. These twenty-one patients had definite symptoms of toxemia. On x-ray examination the motility of the gastro-intestinal tract of these patients showed normal gastric and small intestinal emptying time but a definite retardation in the large intestine. This slowing-up in the colon was not sufficient to produce an absence of daily bowel movements but the retardation was enough to cause each bowel movement to be three or four days behind time. It is to this group of cases that I have applied the term, "Delayed Bowel Movement Type of Constipation."

Motility observation of the digestive tract is essential to the correct interpretation of symptoms in this group of patients. The symptoms are just as profound as those observed in obvious types of toxemia from the intestinal tract. The co-operation of the patient is difficult to obtain unless the physician can demonstrate by serial x-ray plates that there is a definite stagnation in the colon. Once this confidence is obtained the remainder of the therapy is directed toward increasing the emptying time of the large intestine by

means of a laxative diet, proper exercise or massage and perhaps mild laxative measures.

It is true that those doing multiple examinations on large series of patients will often find equally as marked delay in emptying of the colon in perfectly healthy people. You have also observed patients in apparently excellent health who have a bowel movement regularly every week, ten days or two weeks. You have also observed patients with profound intestinal toxemia with moderate constipation. The patients included in this series have all been carefully studied and every possible source of intoxication outside of the intestinal tract removed before treatment was instituted. Only patients who have been restored to normal health by methods mentioned above have been included in the twenty-one cases.

Because of the severity of symptoms it would seem interesting to detail the histories of a few of these patients rather than to attempt a symptomatic classification or resume.

CASE No. 282-35: A woman, aged 34, divorced.

COMPLAINT: Indigestion; attacks of headaches; nausea and very foul breath.

PRESENT ILLNESS: Started about eight or ten years ago following childbirth, when she began to have attacks of headaches, culminating in nausea and vomiting. At that time

*Read by invitation before the Arizona State Medical Association, at Prescott, Arizona, June 14-16, 1922.

would have an attack about once every two months. About six years ago began to notice a very bad breath. This came on after the birth of her second child. Would occasionally have attacks of severe abdominal cramps followed by diarrhea. If all food was stopped for two or three days the diarrhea would disappear. For two or three years got along fairly well but for the last three or four years she has had a very bad breath about three-quarters of the time. Has a headache on awaking almost every morning. Bowel movements have been very regular; very seldom takes a laxative and then only on "general principles." The first part of the bowel movement is firm but the last portion of it is soft formed. Occasionally has some gas pains. Is considerably under weight, has very little appetite and is tired all the time. The remainder of her history was unimportant.

PHYSICAL EXAMINATION was unimportant.

LABORATORY EXAMINATION: Blood count and urine examination were normal. Stool examination was normal excepting that there was a moderate amount of mucus, with some pus cells mixed in the mucus. Rehfuß test breakfast showed normal acidity. Wassermann test was negative.

X-RAY OF GASTRO-INTESTINAL TRACT: Unimportant with the exception of the motility of the large intestine. Before the twenty-four hour examination patient had had a bowel movement, which, according to her own statement, corresponded to a normal morning bowel movement. Head of the barium column was in the descending colon. The entire colon was well filled and not spastic. Forty-eight hour examination, patient had had three bowel movements since the twenty-four hour examination. There was still a great deal of barium in the ascending and transverse colon. Seventy-two hour examination, patient had had one more bowel movement but there was still considerable barium in the transverse colon. X-ray examination showed a marked delay in emptying of the large intestine.

The patient was put on a laxative diet and within three weeks' time the yellowishness of the sclerae, which had been constantly present for the past few years, had completely disappeared from the eyes. The coated tongue had completely disappeared as well as the bad breath. Patient had begun to gain weight and had lost the constant tiredness and was feeling markedly improved in every way. She has remained well for two years.

CASE No. 2037-40: Man, aged twenty-six.

COMPLAINT: Headaches, attacks of tiredness and lassitude.

PRESENT ILLNESS: Started seven or eight months ago. At that time nothing unusual happened excepting that he was doing some night work. Present illness came on rather slowly. First he noticed that he would go two or three days feeling "rotten" and then would feel better again for a week or ten days. This would be followed by another "pepless" spell. He was confined to the office the greater part

of the day. During the past few weeks he has been having frequent headaches. He would frequently awake in the morning with a dull ache across the forehead. At times the headaches would become so severe that he would be unable to think and this would continue for two or three days with no cessation. The severe headaches were always associated with marked tiredness and weakness. During the attacks of weakness would go home so exhausted that we would be unable to sleep, and he would feel dizzy.

GENERAL EXAMINATION was unimportant.

LABORATORY EXAMINATION: Blood count normal. Urine, negative. Rehfuß test breakfast showed normal acidity. Wassermann test, negative. Stool examination, normal.

X-RAY EXAMINATION: Unimportant excepting as it showed marked delay in the emptying of the large intestine.

Although the patient had had regular daily bowel movements, the x-ray showed the descending colon and rectum outlined with barium and barium in the head of colon.

This patient's condition was completely relieved by laxative diet.

CASE No. 2062-15: A business man, aged 43.

COMPLAINT: Tiredness, exhaustion and nervousness.

PRESENT ILLNESS Patient states that he has not been very robust for fifteen years. Although he has continued actively in business he has not been able to do as much as his business associates. Four years ago had measles and lost considerable weight at that time and has not regained it since. About a year and a half after the measles, began to feel very well and strong. Was able to play thirty-six holes of golf without being tired. Had to stop golf after five months because of an injured elbow. Two months ago began playing again but found that after playing nine holes was completely exhausted. However, he continued about his business. A few months ago first began to observe an acid stomach; lots of gas in the bowels and fermentation. Physician placed him in bed for two weeks on a very limited diet and gradually the bad symptoms disappeared. Since that time, however, he has been very weak. He has very little indigestion and practically no gas. He has no endurance. Walking a few blocks results in shortness of breath and pounding of his heart. Temperature has been subnormal. He has had a variable appetite. Bowel movements have been regular each day. Feels "logy" and "dopey" and very markedly depressed. He has no cause for worry but worries about everything. He tires easily.

GENERAL EXAMINATION showed a rather poorly nourished man with a low blood pressure. Otherwise there was nothing remarkable.

LABORATORY EXAMINATION: Blood count normal. Urine examination and kidney function tests were normal. Basal metabolism test was minus 7.5 per cent. Test breakfast showed normal acidity. Stools normal.

X-RAY EXAMINATION showed the small intestine practically empty in six hours and the colon outlined almost throughout. At twenty-four hours, after a fairly normal bowel movement, the position of barium mass was practically unchanged. At forty-eight hours, although patient had had two more bowel movements, there was only some thinning in the ascending and first half of the transverse colon, the remainder of the colon being fairly well filled with barium mass.

Further observation was impossible as the patient was leaving the city. This man was placed on a laxative diet and mildly laxative measures and within a period of two weeks symptoms above described had completely disappeared and he has continued in the best of health up to the present time.

CASE No. 1782-29: A business man, aged 43 years.

COMPLAINT: Gas in the stomach.

PRESENT ILLNESS: Patient has complained of gas in his stomach since he was ten years of age. Aside from belching and passing flatus there had been little discomfort until the last year. During this time has had a few very severe attacks but never entirely free from distress in the abdomen. Usually severe distress in the stomach is relieved by a glass of hot soda water. When having a great deal of distress in the stomach found relief by going on a milk diet for two or three weeks at a time. When on the milk diet would find it necessary to take laxatives. Otherwise, has not taken a laxative in twenty-five years. He has had a regular bowel movement every day. Patient has had a coated tongue most of the time and also a bad breath. He has not observed any headache. He has felt tired and nauseated. Otherwise his history was unimportant.

GENERAL EXAMINATION: Negative excepting for large, chronically infected tonsils.

LABORATORY EXAMINATIONS Blood, urine and Rehfuess test breakfast were normal. Wassermann test, negative.

X-RAY OF THE GASTRO-INTESTINAL TRACT: Showed appendix well filled and terminal ileum empty at six hours. At the end of twenty-four hours patient said that he had had two normal bowel movements. Colon was very well filled throughout its entire course. Forty-eight hour examination: Patient had had another large bowel movement but the colon remained well filled. Seventy-two hours: Patient had had two more bowel movements but there still remained a well filled appendix and considerable amount of barium in the ascending and transverse colon; showing a rather marked delayed bowel movement type of constipation.

This man was placed on a laxative diet and mild laxative and was completely relieved of symptoms in one week's time and has remained free of symptoms since the examination, three months ago.

CASE No. 1486-48: A doctor, aged 37 years.

COMPLAINT: Attacks of indigestion, weak-

ness marked mental depression, and loss of weight.

PRESENT ILLNESS: Patient states that for a number of years he has had attacks of indigestion which amounted to a fullness, distention and a bad taste in the mouth. These symptoms were relieved by taking a Sedlitz powder. About two years ago attacks became more severe and there was more depression with them and they would last for two or three days. He has been having an attack about every week during the last year and has lost twenty pounds in weight. He has lost all his "pep". Hands have become cold and clammy. Blood pressure has remained about 100. He has had a little edema of the ankles. He has had very marked mental depression in recent months, so much so that it was almost impossible for him to live with his family. He would come home at night so depressed and ill tempered that he would go around and whip all of the children. He had attempted suicide because of this marked mental depression. The patient said that he had no cause for worry but was so tired and exhausted all the time that he would be unable to "get above it." At times during these attacks would have to be in the hospital for from one to two weeks because of the marked weakness and mental depression. He had his appendix removed one year ago in the hope that his condition would be relieved. There has been no improvement since that operation. He has a coated tongue constantly. He never awakens in the morning with a headache or has sick headaches. Odor of the stools is usually foul. He has been examined repeatedly by various physicians and has been x-rayed on various occasions and nothing pathological found. He has daily bowel movements. Otherwise his history is unimportant.

...GENERAL EXAMINATION: Negative excepting for moderate under-nourishment.

LABORATORY EXAMINATION: Test breakfast, urine and stool examinations were normal. Wassermann test was negative.

X-RAY GASTRO-INTESTINAL TRACT: Terminal ileum was practically empty in five hours. Twenty-four hour examination showed the entire colon well filled even though patient had had a normal morning bowel movement. Forty-eight hour examination showed the large intestine still well filled, although the patient had had two large bowel movements since the twenty-four hour examination. At seventy-two hours there was still considerable barium in the colon. Patient had had one bowel movement since forty-eight hour examination.

This man was placed on a laxative diet with mild laxative and did not report for three months. At that time stated that he had not had a single bad attack; that he had gained twenty-five pounds in weight; that his tiredness had completely disappeared; that he had no longer a coated tongue; that the mental depression had gone and that he was again living happily with his family.

CASE No. 1272-40: Lawyer, aged 25 years.

COMPLAINT: Headaches, mental depression, tiredness and stomach trouble.

PRESENT ILLNESS:.. Patient thinks that he has had headaches all his life. Years ago would have headaches at irregular intervals of from one week to two or three months. Recently they have been more severe and more frequent. He has had attacks which would last from one week to a month. Often he awakens with a headache so severe that it will be necessary to stay in bed in a dark room for two or three days at a time. These headaches are frequently associated with severe nausea and vomiting. Attacks have become so severe that he has had to be excused by the court in the course of a trial. There is marked vertigo and faintness at times. Photophobia is usually present during severe headaches. Tonsils were removed one year ago but afforded no relief. There has been considerable indigestion, belching, sour stomach and regurgitation of food. He feels "dopey" and depressed during and between attacks. On two occasions he had purchased lysol with suicidal intent. He has lost several pounds in weight and has a very poor appetite. He has regular bowel movements twice each day, and he has taken no laxatives. Otherwise his history was unimportant.

GENERAL EXAMINATION was unimportant.

LABORATORY EXAMINATION: Urine, blood and stools were normal. Wassermann test was negative.

X-RAY GASTRO-INTESTINAL TRACT: Stomach and small intestine emptied normally. Twenty-four hour examination, patient had had two normal bowel movements. Colon was well filled. Forty-eight hour examination, patient had had two more bowel movements. There was still considerable barium in the colon.

On laxative diet and mild laxatives the

symptoms completely disappeared in two weeks' time. This patient has been entirely well for one year.

The other cases are equally as striking in symptomatology, findings and relief, but those just described are quite sufficient to illustrate the intensity of intoxication which patients may have from the intestinal tract with no obvious constipation.

As stated above, this group comprises only five per cent of those patients having symptoms referable to constipation, but it is a group which shifts about from one physician to another without relief. When once recognized their condition is simply cured, usually by diet alone.

CONCLUSIONS

1. By delayed bowel movements form of constipation is meant regular daily evacuations which are two or three days behind time.

2. Motility x-ray examination of the gastro-intestinal tract is essential in: (a) Recognition of this form of constipation: (b) Convincing the patients that their bowel movements are delayed.

3. About five per cent of patients suffering with intestinal intoxication are of the delayed bowel movement type.

BASAL METABOLISM IN CLINICAL MEDICINE*

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In order to have a clear conception of what is meant by the term basal metabolism, we will first define and consider metabolism as a whole. The products of digestion, absorbed from the gastro-intestinal canal, undergo various transformations in the body. Some are broken down almost immediately into simpler compounds which are then eliminated from the body by the excretory organs; some are stored, either unchanged, or after modification, and are used later as needed, while still others serve to

build up the complex living protoplasm of the tissues and are ultimately disintegrated into waste materials. These chemical transformations within the body constitute its metabolism.

In studying metabolism, one may follow an individual food material from the time of its absorption until it is finally converted into waste products. In this way it is possible to speak of a protein metabolism, a fat metabolism, etc. Disturbances in these individual chemical processes

*Read before the Cochise County Medical Society.

give rise to definite clinical entities. On the other hand, metabolism may be considered collectively from the standpoint of energy transformations, and thus be termed energy metabolism. The body is a combustion apparatus in which various materials derived from the food are hydrolyzed, oxidized, and otherwise altered by means of special ferments, until they finally liberate energy, which leaves the body mainly in the form of heat. Thus the total metabolism in the body may be expressed in terms of energy, and the heat unit, or calorie, is commonly used for this purpose.

Means of Measurements: May be divided into two general classes (1) direct calorimetry; (2) indirect calorimetry.

The total metabolism may be determined directly by placing the individual in a suitable calorimeter and measuring the heat given off from the body through conduction, radiation, and evaporation, at the same time making allowances for any change in the temperature of the body itself. This is **DIRECT CALORIMETRY**.

The energy liberated in the body may be calculated if we know how many grams of fat, of carbohydrates, and of protein are consumed in a given time, for each gram in burning liberates a definite and known amount of heat. This method is known as **INDIRECT CALORIMETRY**. In order to determine the **TOTAL** metabolism by this method it is necessary to estimate the amount and kind of material consumed in the body. This must be done by a study of the waste products eliminated. The nitrogenous waste in the urine furnishes an index of the rate of protein metabolism. The absorption of oxygen and elimination of carbon-dioxide through the lungs furnishes a measure of the metabolism of carbohydrates, fats, and the non-nitrogenous proteids. The separate amounts of carbohydrates and fats burned are estimated by determining the ratio between the vol-

ume of carbon dioxide given off and the volume of oxygen absorbed by the lungs. This ratio is called the *respiratory quotient*.

Direct as well as indirect calorimetry must take into account the fact that heat as well as waste products may be temporarily retained in the body. It is obvious that there might be considerable source of error from a single observation, and equally obvious that with a long period of observations the errors from these sources will lessen.

Physiological Variations: Determinations of the rate of metabolism show that this is subject to quite considerable variations in a given individual. Factors which influence the rate in a normal individual are (1) muscular exercise and possibly other physiological activities of waking life; (2) indigestion of food. Muscular exercise, even of so mild a form as standing, shows a difference from "sitting metabolism," of as much as 17 per cent, and the severest muscular exertion will increase the rate to 9 or 10 times its minimum. Metabolic studies have shown that there is a greater liberation of heat in the body after the ingestion of food, which may last for twelve hours or more and which varies with the class of food taken. The exact cause for this heat production after food has been a subject of much discussion, but experimental work seems to point definitely to the cause as being due to increased motor and secretory activities of the digestive apparatus, and to some effect produced by the products of digestion **AFTER** they have been absorbed from the gastro-intestinal tract.

Basal Metabolism: It is obvious that since the rate of metabolism is subject to marked physiological fluctuations, any determination that will be useful for purposes of comparison must eliminate, so far as possible, the effects of exercise and food. For this reason such a determination must be made (1) when the individual is fasting in the morning, 14 to 18 hours after the last meal; and (2) with the individual in as complete muscular

and psychic repose as possible. Even this is not the lowest level of bodily energy, as it has been shown to be still lower during sleep. However, it furnishes a convenient basis for computation and comparison.

Methods and Standards: Since heat is the end-product of all vital transformations, the latter could, theoretically, be best measured by some method of determining DIRECTLY the heat given off from the body, but this calls for such an extremely elaborate and costly apparatus, that its mere appearance would be so formidable as to completely unnerve the best of hospital technicians, and is not practical. Fortunately, the indirect methods are available and less awe inspiring. Heat being the result of combustion, and oxygen intake and carbon-dioxide elimination being factors of this transformation, a fairly accurate determination of these factors gives a close estimate of the total heat production, and the end result of glandular and muscular activity is thus indirectly secured. The final outcome of many years' experimentation and study has been the development of portable respiration apparatus that measure with accuracy and great rapidity the oxygen consumption of human beings. This is now accomplished with a relatively simple technic, involving neither respiration chamber, valves, weighings nor gas analysis, as it has been found that the oxygen consumption alone is of prime importance in the vast majority of pathological cases, and that it is of no practical importance to estimate the carbon-dioxide elimination.

Considerable discussion has been evoked by the auxiliary factors to be taken into consideration, such as body surface, weight, age, sex, height, degree of nourishment, barometric reading, room temperature etc., etc. Finally, however, out of the wilds of all this argumentation, the absolutely essential factors have arrived at their proper levels and are furnished in tabulated form with the apparatus. We now, however, find

ourselves in somewhat the same situation as regards metabolism that we were with radiographs, i. e., the difficulty of properly interpreting the findings and their proper relations to the other clinical manifestations of the case, so that we may be in a position to draw deductions that are correct. This may be a matter of no small moment, for, since they may influence for or against operative procedure, erroneous conclusions may actually be of serious harm. We shall, therefore, be obligated to pursue an intensive course of study of the significance of respiratory metabolism so that we may obviate the human error when we apply the tests to pathologic states. This idea of the subject is by no means a simple one and considered beyond the scope of such a paper as this; in fact, it is a subject only to be acquired by individual study, carefully done and frequently repeated, and then, as every new departure of science, the greatest knowledge will be acquired by actual, painstaking experience. It is far better to make NO metabolism tests than to make or interpret them inaccurately.

Clinical Application: For the present the greatest practical clinical application of metabolic estimations seems to be concerned with departures from the normal function of the ductless glands, notably the thyroid. It being well recognized that one of the main functions of the thyroid is to regulate the intensity of combustion within the body, it follows that when the gland is overactive the basal metabolism would be increased, and when underactive, decreased. The order of magnitude of these changes is somewhere in the neighborhood of an elevation of from 20 to 40 per cent in mild, 40 to 60 per cent in moderate, and 60 to 100 per cent in severe hyperthyroidism, and a drop of from 20 to 40 per cent in myxedema. Thus the determination of the basal metabolism in thyroid cases constitutes essentially a functional test of that gland. Just as the progress of a febrile disease is rendered more easy of visualization by the

graphic clinical chart, so a graphic metabolism chart helps visualization of progress in thyroid disease. The febrile case chart takes cognizance of three factors—pulse, temperature and respiration; the thyroid chart also consists of three curves, i. e., pulse, basal metabolism and body weight, and such charts when embracing a period of months, present at a glance a striking picture of such patient's progress. However, it may be stated that metabolism determinations in thyroid cases is a refinement rather than a necessity. We could, perhaps, take reasonably good care of typhoid cases if we were deprived of the clinical thermometer; so we can with our thyroid cases without a metabolism apparatus. But, provided they are carefully made and correctly interpreted, they will add a quantitative aspect to the impression of the case that will, to say the least, be of assistance in determining the effects of treatment, either those measures in hyperthyroid states, which are designed to reduce thyroid activity, or thyroid therapy in hypothyroidism. In the latter, particularly, they aid in determining the exact dose of the gland substance which is necessary to cause the patient's metabolism to assume and stay at a normal level.

Outside of thyroid diseases, the metabolic determination as a diagnostic procedure or functional test does not as yet seem to play an important role. Up to date the calorimetric methods are not of fundamental importance clinically, but belong as yet primarily to the research branch of medicine. One other direct clinical application, however, is in the matter of obesity. Published studies have shown that in simple obesity the basal metabolism is normal. Such obesity is due to a disproportion between food intake and bodily activity, and not to any fundamental change in the rate of combustion in the body. In such persons the giving of thyroid raises the metabolism to an abnormal level, producing, in other words, an artificial hy-

perthyroidism. The treatment, then, of simple obesity with thyroid therapy would appear pernicious, relieving one evil by creating another. By means of metabolism, the case of simple obesity can be differentiated from that due to endocrine disease. This applies not only to hyperthyroid obesity, but to pituitary as well, for in hypopituitarism there is a reduction in the metabolism level, just as in hypothyroidism, though perhaps of lesser degree.

Of diseases other than the thyroid and pituitary, in which there are alterations in the basal metabolism, the most striking are leukemias and severe anemias—notably pernicious anemia. The significance of these changes, however, is as yet not clearly understood, and they have at present no routine diagnostic or therapeutic bearing, although it is quite likely that later they may have.

The basal metabolism in acute febrile and infectious conditions has been considerably studied, but the results are more of academic interest than of value to the clinician.

In conclusion, I will present excerpts from the opinions of various men, as follows:

George W. Crile: "We feel that the best guide, after all, is the judgment of the surgeon or physician. For example, the basal metabolism rate will tell you how much reserve there is in the myocardium, in the liver, and in the central nervous system."

Charles H. Mayo: "After all, the importance of the subject relates mostly to chronic diseases, and especially to diseases of the thyroid, * * * Enough is now known concerning the thyroid, its function and diseases, so that in severe types of hyperthyroidism, basal metabolism determination, while not the sole indicator of severity, is of importance considered with the symptoms. Without it, psychoneurosis might be classified in the category of hyperthyroidism."

A. E. Rousell: "Many cases of hypotension are unrecognized. Some of them with edema and albumen and casts in the urine, will necessi-

tate the estimation of the basal metabolism for a correct diagnosis, just as a study of the blood chemistry is necessary in some forms of nephritis. The study of the basal metabolism is an important adjunct to the practice of medicine, as are other methods of precision, and, just like these other methods of precision, it has its limitations."

Henry S. Plummer: "It is the obligation of everyone interested in thyroid surgery to avoid the error of accepting basal metabolism as an index of the operability of the patient. It is the status of the patient relative to basal metabolism that is of much significance in determining operability of the patient. It is the most fundamental measure of the patient's condition."

Summary: In the review of the present day knowledge of the subject it would seem safe to make the following comments:

(1) Basal metabolism can furnish us with a quantitative test of the activity of the thyroid, and enable us to visualize the progress of patients with thyroid disease, to control fairly accurately the treatment of them, and will aid in clinching the diagnosis in certain border-line diseases.

(2) It has thrown light on the nature of obesity and furnishes us with a means of distinguishing between simple and endocrine obesity.

(3) It must be used only as an auxiliary in determining for or against operative procedure.

(4) Ability to correctly interpret and apply findings must be acquired as thoroughly as the technic of using the apparatus.

(5) Considerable information of practical application in certain chronic diseases may be confidently anticipated.

HENOCH'S PURPURA; REPORT OF A CASE*

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For the purposes of classification, purpura may be divided into two groups: first, idiopathic or primary, in which there is no associated disease or known toxic condition present; second, symptomatic or secondary, in which the symptom complex is dependent upon the presence of a definite pathological entity. Both of these groups may be further subdivided into simple and hemorrhagic purpura. In the latter there is a definite diminution in the number of blood platelets present, while in simple purpura there is no alteration in this element of the peripheral blood. Belonging to the simple idiopathic group, is that peculiar condition known as Henoch's Purpura, or purpura abdominalis, a disease characterized by recurrent attacks of purpura, associated with abdominal symptoms such as

pain, vomiting and, occasionally, diarrhea.

The first accurate description of this condition was made by Henoch¹ of Berlin in 1874, although Osler² states that the first case to be described is contained in Willan's work on cutaneous diseases, published between 1796 and 1808. A rather superficial review of the literature available would indicate that the disease is of infrequent occurrence. In four large general hospitals, idiopathic purpura occurred 192 times among 336,478 admissions, covering an average period of 29 years. In 194 cases of idiopathic purpura analyzed by Pratt³, Henoch's purpura occurred 45 times. Comparing the two series, it will be seen that Henoch's purpura occurs about once in 8,000 cases,—rather a low incidence.

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Henoch's purpura is principally a disease of childhood, the great majority of cases occurring before the age of puberty, although cases have been reported in adults of 40 to 50 years of age, Tice⁴ having seen a typical case occurring in a woman 59 years old. Males are more frequently affected than females in the ratio of nearly three to one. Heredity seems to play no part in the etiology of this disease, while season and environment are equally without significance.

As the above classification indicates, there has been found no well defined, causative agent, nor are the symptoms explainable by the co-existence of any infection, constitutional disease, or known toxic condition. Some general vascular injury is probably responsible for the condition, due possibly, to an endotheliolysis such as that described by Gay and Southard in their studies on anaphylaxis. This view gains further support in the very frequent association of those vasomotor disturbances, such as, edema, urticaria and erythema, with idiopathic purpura. In the angioneurotic type of purpura, particularly, the symptoms very closely resemble an anaphylactic reaction. Infection has been held responsible by many investigators, but repeated blood cultures have given uniformly negative results.

An attack is usually ushered in by a fever, which may reach 102.2° , accompanied by pain in the joints, particularly the wrist, knee and ankle joints. Several joints may become involved in succession, and the clinical picture suggest an acute articular rheumatism.

Puffiness about the joint is very common. In a few days, sometimes in a few hours, a purpuric rash appears, principally upon the extensor surface of the extremities, although the face and trunk may be involved as well.

The cutaneous lesions consist of rounded or oval, purplish spots, which vary greatly in size, and which do not disappear on pressure. They gradually fade and pass through all the stages of a contusion before disappearing, which usually occurs within a few days.

The most distressing symptom is abdominal pain, which is colicky in char-

acter, and which is usually referred to the region of the umbilicus. It may be accompanied by vomiting, the vomitus containing blood in those instances in which there has been hemorrhage into the digestive tract. When the latter condition is present, melena also occurs, either with or without diarrhea. Tenderness and rigidity are occasionally present in the epigastrium. According to Osler⁵, the abdominal pain is associated with a localized urticarial edema of the gastro intestinal walls, a condition which has actually been found at operation during an attack of colic.

Minot and Lee⁶ state that the infiltration of the intestinal walls by serous or sero-hemorrhagic fluid may be so extensive as to change the intestinal tube to the size and consistency of a piece of rubber garden hose. Such a condition would predispose to obstruction, either by occlusion or intussusception.

Hematuria is of frequent occurrence, the blood coming, in the great majority of cases, from minute foci of hemorrhage in the kidneys. An edema about the uriniferous tubules may so depress the renal function as to cause a considerable albuminuria. The blood picture is negative except for a moderate leucocytosis, the white count rarely exceeding 14,000. There is no diminution in the number of blood platelets and the coagulation time of the blood is not prolonged as is the case in the hemorrhagic form of purpura. An enlargement of the spleen is occasionally found.

The attacks last from a few hours to several days, and the duration of the entire illness, which is made up of several attacks, averages about one month. Recurrence is common, often at such frequent intervals as to justify the recognition of a chronic form.

The most common, as well as the most serious, complication of this disease is acute nephritis. In the series studied by Pratt⁷ it occurred in nearly 50 per cent of the 43 cases. Christian⁸ is of the opinion that the renal disturbance is not to be classified as a true nephritis, for it is a rare thing to see a case develop chronic nephritis, even when the primary condition in the kid-

ney was apparently very severe. However, no matter what the underlying pathology may be, uremia does occur in certain rare instances, although it should be noted that uremic symptoms may be due to cerebral hemorrhage or a localized cerebral edema. Among the rare complications may be mentioned cerebral hemorrhage, pericarditis, endocarditis, pleuritis, intussusception, etc.

The occurrence in a child of arthritic pains, visceral crises, and purpuric rash, should render the diagnosis easy. However, the preponderance of any one symptom may be misleading. For instance, when the arthritic pains are severe, and especially when several large joints are involved in succession, it may be mistaken for acute articular rheumatism. It will be remembered, however, that purpura is very rare in rheumatism and that the visceral crises are lacking.

The cutaneous lesions may be closely simulated in serum disease, but a history of serum administration can be obtained and the illness will consist of a single attack.

The dominant feature of the disease, abdominal colic, should serve to differentiate it from the other members of the simple idiopathic group, although at times this may not be possible, since they are so closely related that it is probable they merely represent different degrees of the same disease.

The association of visceral crises with initial constipation, later melena, abdominal tenderness and rigidity, may lead to the mistaken diagnosis of intussusception or other acute abdominal condition, but the intermittent character of the attacks with the presence of a purpuric rash and arthritic pains, should serve to clear up the diagnosis. It is of the utmost importance, from a surgical standpoint, that the differentiation be made, for cases of Henoch's purpura have come to operation under the mistaken diagnosis of appendicitis, acute intestinal obstruction, etc. Therefore, Henoch's purpura should be eliminated from the diagnosis, before operating upon any child with acute abdominal symptoms.

The prognosis of Henoch's purpura is excellent, especially in the young. Herbert French⁹ states that recurrences cease in nearly all cases at the age of puberty. The great majority of fatal cases occur as a result of the renal complications, Minot and Lee¹⁰ stating that a mortality of 5 per cent may be expected from this cause. Since some grade of nephritis is found in practically 50 per cent of all cases, it will be seen that recovery from even this complication is distinctly the rule. Albuminuria may persist for some time without other symptoms. Less frequently, death is due to cerebral hemorrhage, or intussusception.

The treatment of this condition is entirely symptomatic. Since exercise and the upright position favor the occurrence of the cutaneous hemorrhages, rest in bed is of the greatest importance. This measure and physiological rest of the gastro intestinal tract by a properly regulated diet, seems to lessen the severity of the visceral crises. Drugs, apparently, have very little effect upon the course of the disease, although frequently repeated doses of sodium bicarbonate seemed to afford considerable relief in the case to be reported. For this I can offer no adequate explanation.

CASE REPORT

The patient, a school girl, 6 years of age, of Irish-American parentage, was first examined by me on December 2, 1920. She complained chiefly of swollen, slightly painful joints, severe colic and vomiting.

Her past history was essentially negative except that her mother said the child had always been nervous and subject to frequent attacks of urticaria, especially in the colder weather.

The family history was negative except for the nervous temperament displayed by all the brothers and sisters, two brothers and two sisters—and the occasional urticarial attacks to which they are all subject, not to the same extent as the patient, however.

The present trouble began six days ago, at which time the mother noticed that the child was very nervous and flushed, as if she had a high fever. The following day she noticed that the feet and ankles were covered with red blotches which later became black and blue.

The feet, ankles, and back of the hands were swollen, but the accompanying pain was slight. The child complained of an occasional stomachache of moderate severity. Several days later the pain became severe, at times

extreme, and was accompanied by vomiting, first of food, and later of a greenish fluid which was apparently bile admixed with the gastric fluid. Microscopically, there was no blood in the vomitus. The pain, which was colicky in character, was constantly referred to the region of the umbilicus. The attacks of colic were intermittent, lasting, as a rule, several hours at a time, with intervals of comparative comfort. No record of the number of attacks was kept, but they occurred with varying frequency over a period of six weeks. The bowels were constantly constipated. No blood was ever noted in the stools.

November 30th, a swelling appeared in the lumbar region just to the left of the spine. This swelling was extremely tender and any motion of the part, or pressure thereon, caused her great pain. It persisted for 4 or 5 days and then disappeared without leaving a trace.

PHYSICAL EXAMINATION: The patient was a bright, alert, but rather poorly nourished, and frail looking girl. The tongue was slightly and uniformly coated. No tremor. At the first examination no pathological or abnormal signs were found in the heart or lungs. On December 15th, there was a roughening of the first heart sound, heard at the apex, but more pronounced in the 3rd intercostal space just to the left of the sternum. It disappeared in three days. Examination of the abdomen was negative except during an attack of colic when there would be tenderness and slight rigidity in the epigastrium. The spleen was not palpable.

There was a very tender, swollen area in the left lumbar region, extending from the 12th rib above to the crest of the ilium below and to about the post-axillary line laterally. The swelling was not marked and could rather be referred to as a fullness on that side. It did not pit on pressure, nor was there any discoloration of the overlying skin.

On December 17th the extensor surface of the feet, lower legs, hands and forearms were covered with a purpuric rash. The spots, which varied in size and morphology, did not disappear on pressure. At first of a bright red color, they later became purplish, then yellow, and finally disappeared completely. There was a distinct puffiness of the extensor surfaces of the hands and feet which lasted several days.

The temperature ranged from 98.6 to 102.0 but was usually about 99.6. The pulse rate varied from 90 to 100 per minute. The coagulation time of the blood was not prolonged beyond normal limits. Unfortunately, the facilities for making a blood count were not at hand. Examination of the urine on December 8th disclosed a trace of albumin, with many red blood cells and occasional pus cells, but no casts. A later urinalysis, performed on December 17th, revealed an occasional granular cast and pus cell, but no albumin.

A diagnosis of Henoch's purpura was made, based upon the following summary of the clinical findings:

1. A recurring purpura.
2. Joint involvement, with only slight pain and trivial fever.
3. Recurring attacks of abdominal colic localized about the umbilicus.
4. Hematuria.
5. A history of frequent urticarial attacks.
6. The age incidence.

Treatment consisted of general measures, such as, rest in bed, light, soft diet, fresh air and sunlight. Calcium lactate seemed to have no effect in preventing recurrences of the purpura. Frequently repeated doses of sodium bicarbonate did seem to moderate the severity of the abdominal colic.

By January 1, 1921, the patient was free from symptoms and gaining strength rapidly. She was seen recently and there has been absolutely no recurrence of symptoms to date.

COMMENT: The only unusual features in this case were the lumbar swelling and the roughening of the first heart sound, both transitory. The significance of both of these conditions would be merely conjectural on my part. The former may possibly have been due to serous effusion between the fascial planes of the lumbar muscles. The latter may have been a localized edema on one of the valve leaflets or possibly merely a functional murmur without significance.

CONCLUSIONS: 1. Although of infrequent occurrence, Henoch's purpura should be borne in mind, that it may not be confused with certain surgical conditions of the abdomen, which it sometimes closely resembles.

2. The urine should be examined frequently for evidences of acute nephritis, since this is the most common, as well as the most serious complication of this disease.

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ROENTGEN FINDINGS IN THE COMMON BONE LESIONS*

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Although there is an axiom in the x-ray study of bones that only two changes, namely, bone destruction and bone reproduction, can be demonstrated on the plate, many indeed, are the variations in these two basic processes. When one considers the point of origin, the nature of the destruction as to path of extension and the portion of the bone involved, the character and situation of the new bone formation, whether endosteal or periosteal, and its arrangement, multiplicity of lesions and relation to soft tissues, it becomes evident that an enormous number of combination pictures are presented, which furnish a radiograph that is usually pathognomic of the lesion observed.

One is impressed by the high percentage of correct diagnoses roentgenologists can make from plates alone. Such ability demonstrates that there are certain well-defined characteristics of the radiograph which allow of pretty accurate differentiation of the disease processes in bone.

It is these fundamental, or type, variations in the X-ray picture in the common bone lesions of osteomyelitis, syphilis, tuberculosis and malignant bone neoplasms that I wish to present, together with a brief interpretation of the underlying pathological changes.

In osteomyelitis, the blood supply of the bones determines localization of foci of infection. Many metaphyseal arteries perforate the epiphyseal cartilage and end as terminal arteries in the epiphysis. These persist up to the termination of bone growth. Then the diaphyseal or shaft group become relatively smaller and smaller with advancing age. There is less narrowing of the metaphyseal and epiphyseal groups as age advances, with consequent increase in the vascularity about the joints. The terminal arte-

ries of all three groups end near the epiphyseal line, hence, here will develop most foci of infection.

Pyogenic osteomyelitic infections are usually embolic. When metaphyseal or epiphyseal arteries become blocked, there develops a wedge-shaped area beneath the cartilage or periosteum. In the phalanges the diaphyseal arteries are relatively large, hence infection usually starts in this portion.

The earliest evidence of acute osteomyelitis upon the X-ray plate is an area of lessened density within the cancellous bone or within the medullary cavity. But, pathologically and usually clinically, this is a comparatively late change. It is commonly seven to ten days from the onset of acute symptoms before this picture appears. If during this roentgenologically negative period the medullary cavity be opened, it will be found filled with pus, as are also the Haversian canals; the periosteum will be inflamed and even the skin reddened, but still no bone destruction.

The inflammation extends rapidly along the medullary canal, over the path of least resistance. The pressure becomes excessive and the exudate emerges through the Haversian canals, quickly killing the fibrous tissue, but the calcium salts are removed only by granulations, which are a reparative process. Hence the roentgenologically latent period.

Bone absorption has been shown to be almost entirely due to direct action of fixed cells, the osteoclasts. These cells probably produce an acid medium in contact with the cell by which bone is dissolved.

The surface of dead bone that is adjacent to living bone becomes extensively eroded by the action of the granulations arising from the living

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bone, but surfaces of dead bone remote from living bone and its granulations show little evidence of destruction. Erosion of dead bone gives a blotchy reduction in density in contrast to the even reduction in density of atrophied living bone. Atrophy in the cortical portion shows longitudinal striae due to the dilated Haversian canals. Dead bone about the opening of a sinus, that is constantly bathed in toxins and pus, thus preventing granulations, is apt to show very slow absorption.

As the pus emerges through the Haversian canals at multiple points, it leaves intervening areas of comparatively normal bone. This is diagnostic. These areas become sequestra and maintain their density much longer than the neighboring living bone, which is subject to the added factors of toxic rarefying osteitis and atrophy of disuse. The greater density of dead bone, its sharp, irregular outline, and the presence of a line of demarcation are points of greatest assistance in determining viability.

The periosteal reaction in osteomyelitis is characteristic. The proliferation of this normally invisible membrane may be among the earliest signs. The infection, having extended through the canals, raises it as a blister from the cortex. Being at the periphery of the inflammation where the toxin is less virulent, the stimulation causes early deposit of calcium salts. These are light and fluffy, giving a sort of "cotton-ball" appearance. Exaggeration of this condition may give the appearance of a shaft actually expanded. It will be noted, however, that an area of uncalcified inflammatory tissue separates this deposit from the shaft, which is still present.

If the infectious process be limited to the cancellous portion, the granulations may permeate the interstices of the sequestra, giving a fairly uniform reduction of density, while multiple foci of infection may cause a blotchy reduction in density of the living portion, thus reversing the

commoner picture that has been described.

Brodie's abscess is seen as a definitely circumscribed area of destruction in the cancellous bone on the shaft side of the epiphyseal line.

Generally speaking, in pyogenic osteomyelitis bone destruction and bone production are about equally in evidence. When the infectious agent is of low virulence, the latter predominates and the picture is one of localized or generalized osteosclerosis. The compact bone shows vacuolated areas uniformly distributed through its substance, with occasionally a small, dense sequestrum in the center. It is essential that such be located, as the surgeon contemplating grafting or transplanting will wish to know of their presence.

The determining factors in the localization of tuberculosis in bone are extremely varied and many explanations have been advanced. Generally stated, from the standpoint of the pathologist, there is a preponderance of evidence to show that, commonly, the primary focus in bone occurs within the epiphysis, or less frequently in the metaphysis. Roentgenologically, the findings point to a much greater incidence of primary focus within the synovial membrane. Pathological evidence to combat this latter supposition is necessarily obtained comparatively late in the disease, if obtained at operation, and if at autopsy, is apt to represent terminal lesions. The routine X-raying of sprains and contusions about joints is giving early evidence in the development of tuberculosis not previously available.

The localization of this infection about the joints can be explained to some extent by the distribution of blood supply previously noted. The presence of synovial membrane and of the red marrow of spongy bone are probably the greatest determining factors in this process. The synovial membrane, with its folds and the freely anastomosing lymphatics beneath, becomes a vulnerable point for the commoner lymphogenic

infection. The many reticulo-endothelial cells, or macrophages, within the venous spaces of the red marrow, proliferate and collect about blood borne bacilli, which may develop into an epiphyseal focus.

The earliest X-ray evidence commonly seen is a haziness about the joint. This is accompanied by soft tissue swelling and some widening of the joint space, due to fluid within it. When compared with the corresponding joint the picture appears roentgenologically poor. Soon the growing epiphyses show squaring and enlargement. This squaring is not confined to the particular epiphysis that may later show necrosis, but involves the contiguous epiphyses as well. Similarly, the bones of the carpus and tarsus show advanced development over the normal side. After the period of growth the same infection shows a characteristic reduction of volume and clubbing together. Next, the joint space will be seen to become narrowed, due to the absorption of the articular cartilage. Thence the infection spreads to the cancellous bone, giving an irregular and worm-eaten appearance, leaving no areas of normal bone. There is usually a considerable period, however, before these areas of decreased density appear. This is probably due to the fact that the tuberculous granulations surround the trabeculae and cut off their nutrition, but very slowly absorb them, giving the so-called bone sand, which cannot be distinguished on the plate from the original trabeculae. This phenomenon may account for the fact that many foci really primary in the epiphysis do not show up until after evidence of intra and periarticular infection are well in evidence. Occasionally the granulations cut off a portion of the cancellous bone en masse, thus forming a sequestrum within a necrosed area, thus simulating a pyogenic osteomyelitis.

A very characteristic feature is the general decreased density of all the bones about the infection. This is a regional atrophy due, primarily,

to disuse, but partly to alteration of the circulation and toxicity of the part, and appears from the third to the fourth week of the infection.

New bone formation about an infected joint practically excludes tuberculosis.

Caries sicca, described by Virchow as a luetic manifestation, but since proven to be tuberculosis, is a localized rarefying process in cancellous bone, of gouged-out appearance, of slow progress and without abscess formation. It is commonest in the head of the humerus.

Primary tuberculosis of the shaft is rare. It is usually chronic, localized, and, contrary to type, may be accompanied by periosteal proliferation and simulate chronic pyogenic osteomyelitis.

The earliest evidence of tuberculous spondylitis is probably an erosion of the articulating surfaces of the bodies. This is not usually observed however, and the first obvious change consists of areas of rarefaction within the bodies. The disk is very resistant, until its nutrition is cut off, when it rapidly absorbs, the intervertebral space narrows, and the superimposed body weight compresses the bodies. This causes an anterior angulation, but as the transverse processes are seldom attacked, no lateral deformity. Hence a lateral view is essential. A little narrowing of the intercostal spaces near the spinal column or an egg-shaped shadow beside the vertebra of a prevertebral abscess, visualized because of its contained bone salts, may be the only evidence in an anterior-posterior view with marked destruction of the bodies. Even these may be lacking. The thickness of the part obscures the periarticular changes in tuberculosis of the hip joint, and the earliest changes observed are actual destruction of the head of the femur, without new bone formation. As healing takes place, the haziness and indistinctness about the joint disappears and the parts become sharp and clear.

The manifestations of syphilis of

bone are as protean as are those of other tissues; however, a few typical pictures present themselves.

Bone lesions showing a purely destructive process are apt to be tuberculosis. Those showing both active destruction and active proliferation are apt to be osteomyelitis, while purely formative processes are apt to be syphilitic.

Three processes are demonstrable—osteochondritis, periostitis and gumma. Osteochondritis appears as a destructive erosion on the shaft side of the epiphyseal line in the developing bone, giving an irregular, serrated effect as if bits of cancellous bone had been torn away with tissue forceps. These areas are filled by granulation tissues of low order. Hence epiphyseal separation and syphilitic pseudo-paralysis are common. Although this process is a destructive one, it is almost invariably accompanied by a striking proliferation of the periosteum of the shaft. There are multiple, discrete layers of new bone parallel to the shaft, the most peripheral being the thinnest. In reality, they are circumferential deposits and form a collar of new bone. The layer formation suggests that each represents a period of activity, followed by a period of latency in the infectious process.

In the tertiary lesions of the acquired form, besides this laminated form of periostitis, we see also the so-called lace-work pattern. The swollen periosteum proliferates about areas or foci of infection, giving a reticulated, moss-like arrangement.

Extensive sclerosis of the periphery of the bone occurs. Scattered through the dense bone will be noted multiple areas of rarefaction. Viewed in profile, these will be seen to be scooped out, meniscus like depressions, which are confined to the substance of the dense new bone, and not scattered throughout the cortex, or endosteal new bone as in pyogenic osteomyelitis.

In the late secondary and the tertiary stages gummata frequently form beneath the periosteum, elevat-

ing it and causing some destruction of the cortex. It will be noted that the proliferating periosteum is early making an effectual attempt to limit the infection, and is unbroken except possibly by a minute sinus opening. Accompanying similar lesions are commonly seen.

Obliterating endarteritis and perivascular infiltration about the nutrient arteries cause areas of localized necrosis of worm-eaten appearance. The skull and sternum, particularly, are thus affected.

Charcot joint presents a very striking picture. The joint shows an extreme degree of disintegration out of all proportion to the trivial symptoms. The process is practically painless, hence there is no atrophy of disuse from voluntary limitation of motion. On the contrary, there is always some hypertrophy and bony debris about the joint, usually in great quantity. There is accompanying periosteal proliferation. Besides these features, the Charcot spine shows lateral deformity. The process is probably due to insignificant trauma to a joint, the nerve supply of which has been damaged by a parasymphilitic neuropathy. Eloesser produced a typical Charcot joint in cats by severing the posterior nerve roots and allowing the animals to traumatize the joints.

The presence of a bone lesion is usually pretty well established by the history and physical signs and it goes to X-ray for the primary purpose of determining whether or not the process is a malignant one, and, secondarily, for the further differentiation as to the particular type of growth.

Invasion of the contiguous bone and neighboring soft tissue is the most reliable sign of malignancy.

Because of the ability of the sarcoma cells themselves to absorb bone, there is a destruction en masse, the growth not expanding the cortex, but eroding it concentrically from the point of origin. Benign tumors, due to their slow growth, extend, first up and down the central canal, thence

by pressure cause a spindle-shaped expansion of the bony shell.

Besides the carcinoma and the sarcoma, there are only two other types of tumors that show the characteristic of rapid cortical destruction. These are hypernephroma and myeloma.

Upon the presence or absence of bone production certain growths may be differentiated. The presence of calcareous deposit within a growth limits its possibilities among malignant tumors to osteo-sarcoma and periosteal sarcoma, and among the benign, to osteoma and osteochondroma.

The presence of periosteal bone deposit eliminates bone cyst, giant cell tumor, myxoma and chondroma. In malignant growths, periosteal new bone has a general arrangement perpendicular to the shaft. In periosteal sarcoma, the picture is very striking. The spicules of new bone radiate from the site of origin into the tumor mass, while at the edge of the tumor is seen the broken and flared edge of the periosteum in its ineffectual attempt to limit the growth. The cortex below shows more or less erosion.

Sarcoma of the vertebra is apt to show remarkably little deformity, even after the erosion of more than one vertebra, the consistency of the tumor mass being sufficient to prevent angulation.

As an illustration of the application of these general diagnostic points let us consider Figure No. 1. This lesion shows definite invasion of the cancellous bone of the superior extremity of the tibia. The growth has spread concentrically from the point of greatest destruction, presumably the point of origin. There is no line of demarcation within the medulla between the growth and the normal bone, nor has the epiphyseal line limited the growth. Infections, by cutting off the blood supply to the cartilage, readily absorb it and invade the joint, but neoplasms seldom do. Though the lesion is of comparatively small size, it has eroded the cortex without previous expansion. There is no new bone formation within the

growth, but there is a suggestion of slight periosteal proliferation.

A destructive lesion near a joint and not involving a joint, and without regional atrophy, is probably not tuberculous. A single large area, without sequestration, and showing no areas of comparatively normal bone, and little or no evidence of periosteal proliferation, is probably not pyogenic osteomyelitis.

Thus we have a destructive, central new growth, pretty definitely included among the possibilities of cellular sarcoma, metastatic carcinoma, hypernephroma and giant-cell tumor.

Carcinoma, being carried to the bone by the perivascular lymph channels, usually appears first in the long bones near the middle of the shaft, where the large nutrient arteries enter, while the common site of sarcoma is in the ends of the bones. Too, metastatic carcinoma is rare below the knees and elbows. The picture of hypernephroma is similar to that of carcinoma. The giant-cell tumor, tho only locally malignant, does erode the cortex, but not until after more or less expansion, and seldom in a tumor of so small size. The absence of the irregular dark lines and of a line of demarcation within the medulla speak against giant-cell tumor. The tumor proved to be a cellular sarcoma.

Again let us apply this differential diagnostic outline to Figure No. 2. The lesion is a central one of the middle of the left humerus. The cortex is very slightly expanded and is becoming eroded, primarily in one direction. Although the cortex is not yet broken through, the toxic agent has permeated the Haversian canals and stimulated the periosteum to abundant proliferation. This new bone deposit is parallel to the shaft and loose and fluffy in character. It is limited to the region of the lesion. There is no bone formation within the growth itself, but there is a condensation within the marrow cavity above and below. Other bones showed no involvement, neither did the lungs.



Fig No. 2



Fig No. 1

The point of origin at the entrance of the nutrient arteries suggests either blood-borne infection or metastatic malignancy. Among the medullary neoplasms only the central sarcoma and the periosteal sarcoma show periosteal proliferation. The sharp demarcation, the presence of condensing osteitis about the lesion and the absence of the perpendicular arrangement of new bone, pretty certainly eliminate the malignant growths, and the presence of any periosteal new bone excludes, certainly, cyst, giant-cell tumor, the myxoma and chondroma. The absence of toxin in benign central new growths which might permeate the Haversian canals and the inability of the cells to break loose and traverse the cortex through the canals prevent periosteal stimulation and proliferation in this type of growth.

Hence we are likely dealing with an infection. We cannot be certain that we are not dealing with a tuberculous abscess, but the infrequency of shaft involvement and the even more unusual picture of both endosteal and periosteal new bone in this infection speak against it.

The single lesion, without other bone involvement and with a periostitis limited to the area of the acute process are against lues.

The location in the bone, a process of about equal destruction and proliferation, an eccentric erosion of the cortex, with the type picture of periosteal new bone, appearing before

rupture of the cortex, and endosteal new bone about the lesion all point strongly to pyogenic osteomyelitis. The process at operation was found to be a localized pyogenic bone abscess.

I am mindful of the fact that I have presented only type pictures. No doubt, in the experience of many of you, there stand out conspicuously certain typical cases which do not conform to these laws. If such be true, it emphasizes the fact that these cases are recalled because these features just enumerated have been applied to them and they are interesting and noteworthy for the reason that they are few, isolated and difficult of classification.

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PNEUMOTHORAX TREATMENT OF LUNG ABSCESS*

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Anyone reviewing the literature on the treatment of lung abscess cannot help being impressed with the inability to secure complete recovery in more than half the cases. The majority of surgeons admit that they have only about 50 per cent or less of cures. The

rest of the cases are faced with pulmonary drainage indefinitely by a tube, in order to prolong life; and this with its attending dangers of exacerbation of the abscess, pulmonary hemorrhage from pressure necrosis from the drainage tube, or metastatic abscess in the

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brain in cases of long standing. Neither thoracoplasty nor bismuth injections offer material relief in obliterating the abscess cavity and the persistent drainage (Bevan). In only a small percent of the chronic cases is the abscess cavity obliterated or the discharge checked by surgical drainage. The number of cures is higher in the acute cases, showing the necessity for early intervention.

The operative mortality at the Mayo Clinic is about 35 per cent. Whittmore¹, selecting his cases more carefully, reports an operative mortality of 16 per cent. Probably the average is about 25 per cent. Only about 10 per cent of lung abscesses heal spontaneously. The mortality without operation is about 63 percent (Lord). Walker² in a survey of one hundred and thirty-two cases from the literature reports a medical mortality of 54 per cent, a surgical mortality of 25 per cent. Certainly the tendency for the great majority of abscesses with expectant treatment is for progressive lung destruction due to inadequate drainage through the bronchi. The histories of these cases reveal that little hope of spontaneous recovery should be entertained after several weeks of expectant treatment. Yet a great many physicians employ medical treatment for long periods, hoping for recovery. Goldberg and Biesenthal³ say the medical treatment including posture carries so high a mortality that it is best discarded for surgery. Yet surgical drainage is far from spectacular in its results.

Although the pneumothorax treatment of lung abscess was advocated by Carson of Edinburgh in 1819, it has been very little used until the last five years and even yet to a meager extent.

Tewksbury⁴ was the first American to report its successful use (1917), reporting two cases. A great many prominent pulmonary surgeons evidently do not use it at all as it is never mentioned by them in their treatment. That its use is a valuable adjunct to the treatment of these cases is attested by the ever increasing reports of its successful application. Tewksbury, Slyfield, Goldberg and Biesenthal, Simon

and Sweezer and many others published reports of its successful use.

The association of lung abscess with operations upon the upper respiratory tract, (particularly tonsillectomy under ether anesthesia), seems well established. It should be borne in mind that the majority of pulmonary abscesses are due to operations on the upper air passages. Of thirty-two cases reported at the Massachusetts General Hospital, 65 per cent were due to operations on the upper respiratory tract under ether. Clendenen⁵ believes the incidence of pulmonary abscess is increasing, due to motor driven anesthetic apparatus. Moore⁶ in a survey of this condition following upper respiratory tract operations, concludes the great majority are due to aspiration of infected foreign material. That they are more frequent in the lower lobes and in the periphery of the lung is believed by the majority of investigators. This fact makes success of pneumothorax more probable as those areas are more readily collapsed.

The later tendency is for adhesions to form from the associated pleurisy. In thirty-five cases coming to autopsy at the Massachusetts General Hospital there were adhesions in one form or another in thirty (Whittmore) showing the necessity for early therapeutic collapse of the affected lung.

Pneumothorax treatment is such a simple and safe procedure that it is surprising that it is not more extensively employed, particularly when considering the discouraging results by surgical drainage. It must be attempted, however, relatively early to circumvent the formation of adhesions which render satisfactory collapse of the lung difficult. There is no reliable method to determine preoperatively whether or not adhesions are present. Frequently a perfect collapse will be attained in a case thought to have extensive adhesions. The compression should be accomplished slowly, however, to avoid shock and discomfort and to avoid displacement of mediastinum. One should be careful that the drainage through the bronchus is not obstructed by the compression, which does occur sometimes. It is a good rule to inject not over 300 c.c. at the initial filling and

gradually increase this at short intervals every day or two until full collapse is attained, controlled by fluoroscopy, to avoid over filling.

It is well known among phthisiotherapeutists that adhesions form very rapidly after the lung is allowed to expand following pneumothorax. In the event that drainage through the bronchus is interfered with by this method the air may be aspirated, enabling adhesions to form rapidly, preparing the field for surgical drainage.

It seems it is the tendency for surgeons to postpone operation until a well defined cavity forms. Some surgeons like to have a fluid level revealed by x-ray before operation is attempted. Such delay allows the condition to become quite advanced and produce extensive lung destruction, which is not necessary if there is a free pleural cavity. Pneumothorax can be used as soon as rupture into a bronchus occurs which is usually early.

Lynah⁷, using bronchoscopic aspiration reports good results from this method of treatment. He is enabled by the bronchoscope to dilate or remove any obstruction to free drainage that exists. He thinks some of the benefit may be due to the effect of the x-ray after bismuth injection which is used to map out the abscess cavity. He advocates bronchoscopy as soon as purulent expectoration is present even in the pneumonic stage. At all events this method is a valuable aid in the diagnosis, localization and treatment of these unfortunate cases, but requires expertness and large experience with the use of the bronchoscope.

The results of pneumothorax are so rapid, complete, and attained by such a simple procedure, that it is to be preferred to any other method of treatment. In view of these splendid results it seems to us that the most rational procedure to follow in the treatment of lung abscess would be:

1. Wait no longer than two weeks for decided clinical improvement; then,
2. Institute pneumothorax; in the few cases in which this is not successful,
3. Drain surgically.

A typical result of lung collapse in lung abscess is illustrated by the following case:

No. 1.—R. T. 15-year-old school girl.

Past history negative. On October 15, 1921, had tonsillectomy under ether anesthesia. One week later developed fever, cough and expectoration and pain in right chest. Soon after began to raise foul smelling green sputum.

X-ray examination confirmed diagnosis of an abscess cavity in lower right lung. No improvement was observed after two weeks of medical treatment and on November 11th, 200 c.c. of nitrogen gas was injected into her pleural cavity. These injections were continued every other day for four treatments then every four days until the right lung was collapsed as revealed by the fluoroscope. The fever and cough gradually disappeared and the patient gained in weight. The injections of gas were continued once every two weeks for two months after which time she left town, and now, on June 1st, when she reported for x-ray examination is clinically well.

No. 2.—J. M. Male, twenty-eight years. Ex-service officer.

Had influenza in army and after a few exacerbations apparently recovered. Had tonsillectomy under ether anesthesia about month later. Following this was in fairly good health for about two months then gradually developed cough and expectoration. Discharge became worse, began to raise foul green pus, run fever and lose weight. Examination revealed lung abscess in right lower lung. He was treated medically for about eleven months before coming to Tucson when pneumothorax was begun. With complete collapse, the toxemia increased, fever increased with diminution of sputum and general condition worse. The air was then aspirated and after a few days the abscess cavity was drained and a tube inserted. Following this, patient had a stormy time, later developing empyema which was drained. He gradually recovered from this and became in good health except for a small discharge from the abscess drainage which persisted for about one year and closed. He is now in excellent health.

This case is cited to emphasize the necessity for early pneumothorax thus preventing the formation of scar tissue in the abscess wall.

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X-RAY THERAPY OF THE TONSILS AND ITS LIMITATIONS*

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Every diseased appendix should be removed. Does the same rule apply to the diseased tonsils of childhood and youth?

For four years Dr. Littleton Davis kept records of the tonsillar conditions in several thousand school children at Roanoke, Va. Very large unhealthy tonsils were marked three plus; he states that from year to year about an equal number progressed ing dose of tubercle bacilli received downward from three plus. He also states that cervical glands enlarge as often after, as before, removal of the tonsils. Since, during childhood, a large number of the hypertrophied diseased tonsils regress and become healthy, I believe we should assist nature in her efforts at conserving the tonsils of children, rather than removing them.

In a child's throat, an enlarged tonsil, not markedly reddened, is probably performing an important function. Colonel Bushnell has emphasized the importance of the immunizing of dose of tubercle bacilli received by inspiration and ingestion during childhood. It is probable that the tonsil, by collecting and digesting pathogenic bacteria, plays an important role in immunizing the child to infection.

All enlarged, infected tonsils and adenoids in children and youth shrink and become healthy after a few x-ray treatments. Parents should be so advised and whenever the public comes to understand that radiation cures the infected tonsils of childhood, the method will become popular.

A chronically infected tonsil in time becomes fibroid in character, since this is nature's favorite method of walling off infected follicles and other foci of chronic infection. Whenever there is clinical evidence that infected fibroid tonsils are injurious

to the health of the patient we should recommend and insist on tonsillectomy. Should there be any contra-indication to the operation, the case may be successfully treated with radium or by electro-coagulation.

In both children and adults it frequently happens that removing the tonsils gives but partial relief. There may still be considerable discomfort and clearing of the throat, with attacks of sore throat accompanied by slight temperature, but without the malaise and prostration that accompany an attack of tonsilitis. These throats with infected and enlarged lymph follicles will clear up promptly under x-ray treatment. Thus, in order to get a healthy pharynx, the throat and x-ray men must frequently co-operate.

Witherbee, the originator of the method, has successfully treated several hundred cases of diseased tonsils, and states that there is no contra-indication to x-ray treatment. The danger of injuring the thyroid, parotid or pituitary gland is remote, as it is rarely necessary to give more than eight or ten treatments to the tonsils, while cervical tuberculous glands often require two to four times this number of exposures, with no injurious effects upon these neighboring glands. In ringworm of the scalp the pituitary receives heavy doses from five portals, all directed toward the pituitary, and no one has observed any injury to this gland. With the Witherbee technic for treating tonsils, the surface receives only one-fourth of a full skin dose; consequently there is no danger of an erythema developing.

There has been some question as to the permanency of the results in x-rayed tonsils. Several radiologists have inspected the throats of patients treated during the past ten years for tuberculous glands in the neck, and

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have found their throats uniformly healthy. As many such cases have unhealthy throats and as the throat and tonsils are rayed in treating cervical glands, we must conclude that the results following x-ray treatments of unhealthy throats are permanent.

Surgical removal of the tonsils and adenoids may have any of the complications which are produced by septic emboli, such as lung abscess, empyema, phlebitis, and endocarditis. Other occasional complications are hemorrhage, which is much less frequent than formerly, since our throat men do not usually operate until the coagulation time is normal, and middle ear trouble or mastoiditis, which may complicate the recovery.

The advantages of the x-ray treatment are no anesthetic; no hemorrhage; no severe convalescence or

loss of time; no discomfort or complications.

Cases of rheumatism, chorea, diabetes, chronic endocarditis and hemophilia are usually poor surgical risks. When such cases have diseased tonsils, x-ray treatment would seem to be especially indicated.

Occasionally a concealed abscess has been apparent in the fibroid tissue left after absorption of the lymphoid tissue following x-ray treatment. Isolated by fibroid tissue, such abscesses become sterile and are harmless. In this connection, it is of interest to note that Dr. Hickey, of Detroit, reports treating the throats of diphtheria carriers and was able to rid their throats of diphtheria bacilli in from two to four days in 80 per cent of the cases treated.

RADIUM AND ITS ACTION ON LIVING TISSUE CELLS*

W. WARNER WATKINS, M. D., F. A. C. P., Phoenix, Arizona.

It would be presumptuous in a physician to attempt a scientific discussion of radium before a body of men and women versed in the natural sciences, since that subject primarily concerns physics, chemistry and geology, and bears closely on the philosophic sciences. But a member of one branch of applied science can properly speak to the representatives of general science concerning the applications, within his own field, of the knowledge which has come from the wider realms of scientific research. Without discounting any of the wonders of this marvelous element—radium—in its purely physical and chemical manifestations, or its influence on our intellectual conceptions, certainly the application of radium which is most prominent in the thought of people is its use in treating disease through its biological effects on living matter.

The developments in connection with radium and radioactivity furnish the best possible illustration that medicine is inseparably linked to all other branches of science, as members of one general family. Many of the most important discoveries of the pure sciences have found their greatest usefulness in the practical applications of applied biology, i. e., medicine. Time forbids an enumeration of these, but a most striking example of progressive discovery is that presented by Crookes, who discovered cathode corpuscles and prophetically called them "radiant matter"; Roentgen, who, working with a Crookes tube, discovered x-rays; Becquerel, who with x-rays in mind, detected radioactivity in uranium ore; and Madame Curie, who, in searching for the cause of this radioactivity, discovered radium. Without these antecedent discoveries and the subsequent elaboration of our knowledge

*Read at the Second Annual Meeting of the Southwestern Division of the American Association for the Advancement of Science, at Tucson, Arizona, January 26-28, 1922.

of radioactivity, by Rutherford, Soddy, Ramsay, Wilson, Moseley, and others, there could, of course, have been no biological applications. On the other hand, without the practical applications of the physical properties of radium in biological fields, radium would be a laboratory curiosity today, instead of the most valuable and costly substance known. It is valuable because it can be used to relieve human suffering, and it is costly because it is rare. The applications which applied biology (medicine) makes of the discoveries of its sister sciences are priceless contributions to general science, and all the devotees of the natural, philosophic and pedagogic branches of science must remember this. The healing of a case of cancer, or the eradication of tuberculosis from a child is just as valuable a contribution from science to the world's progress as the discovery of a new star or the evolution of a theory of relativity.

In order properly to introduce even a summary of the effects of radium in the biological realm, it will be necessary to give a brief review of its physical and chemical properties. To do this we must have in mind the fundamental structure of the atom.

The Atom: The structure of the atom has been revealed to us, little by little, through the researches of numerous workers, and a wonderful impetus was given these researches by the discovery of radium and radioactivity. We cannot follow the steps in this brief summary; suffice it to say that the atom, which was once regarded as the final and individual particle of matter, is now known to be a world in itself, more complex in its internal structure than any machine ever conceived by man. Its essential portions are (1) a central compact nucleus which, in proportion to the whole atom, is about like a marble in the center of a lot a half mile in diameter. Yet into this nucleus are packed still smaller particles of matter, called "electrons." There are, in the nucleus of any atom, approximately half as many

electrons as the atomic weight figure of the element to which the atom belongs. These electrons in the nucleus carry positive electric charges, thus deriving their name of "electrons."

(2) Outside of the nucleus, in the vast outer spaces of the atom, are other electrons, the exact number of which are equal to the number of positive electrons in the nucleus. These outer electrons carry negative charges of electricity and probably revolve around the central nucleus much as the earth and other planets revolve around the sun. The space between the negative electrons is so great as compared with the size of the electrons, that these have often been compared to the planets and the atomic free space to the interplanetary space. Millikan has said that the electrons in the atom are about like particles of dust in a large room.

In this conception of the atom, the hydrogen atom consists of a nucleus with one positive electron and one accompanying negative electron. The helium atom has a nucleus with two positive electrons and two satellites of negative electrons. It is now considered fairly certain that each of the heavier elements, at least, has just as many positive electrons in its nucleus as its number in Moseley's table, and a corresponding number of negative electrons in the outer atomic spaces. Thus radium will have a nucleus of 88 positive electrons, with the same number of accompanying negative electrons. In all atoms the positive charges of the nucleus exactly neutralize the negative charges of the free electrons, the atom being in a condition of equilibrium.

Ionization: When any atom becomes divested of one of its negative electrons by application of force, it is left with a surplus positive charge, while the freed electron has a surplus negative charge. These resulting fragments of the atom are said to be ionized; they are, by this means, set in motion and are capable of physical and chemical effects, upon other

atoms. We shall soon see that one of the most important effects of radium upon other kinds of matter is due to its power of ionizing atoms.

Radioactivity: The one fundamental property of radium with which we are concerned is its radioactivity. Even our physical knowledge of radioactivity is by no means complete and we are barely on the threshold of our knowledge of its effects upon living cells exposed to its rays. Radioactivity is due to the spontaneous disintegration of the radium atom. This atom is just like any other material atom until it explodes, or disintegrates. The cause of this explosion is still an unsolved riddle, but many of the effects of the explosion are known. Out of every 100 billion radium atoms, one explodes every second, but the number of atoms is so infinitely great that in the smallest visible particle of radium, so many atoms are disintegrating every second that there is a constant stream of innumerable rays. The result of the atomic disintegration consists of four distinct products with which we are concerned: (1) A particle of an element entirely distinct from radium; this is the alpha particle, which is in reality an atom of helium, or probably simply the nucleus of the helium atom, divested of its two negative electrons and shot off as a positively charged nucleus; (2) a negative electron torn loose from the radium atom by the explosion—called the beta ray or particle; (3) the main residue of the radium atom which comes off as a radioactive gas, called the radium emanation; this gas has all the properties of radium except its length of life; (4) very penetrating rays, called gamma rays, akin to light rays, but of very much shorter wave length.

The alpha rays or particles are shot off with a velocity of about 10,000 miles per second, and in their air flight they pass directly through gaseous atoms, traversing the spaces between the electrons. In air, they have a range of about 7 cm. and in this distance they will penetrate something like half a million atoms of

atmospheric gases. The investigation of the flight of the alpha particles, and their adventures when they collide with electrons or strike the nuclei of other atoms, is one of the most fascinating chapters in scientific research, but cannot be dwelt on here; due to their limited flight and the fact that they cannot penetrate denser matter than gases, their biological application, which is the theme of this paper, is limited.

The beta rays or particles, negatively charged electrons, are shot off with a speed ten or more times greater than that of the alpha rays, some of them attaining the speed of light (186,000 miles per second). They also pass directly through the atoms which lie in their path. The beautiful work of Wilson in photographing the courses of these electrons shows that a beta ray will pass through as many as 10,000 atoms before it will happen to strike another electron, dislodge it and form an ion. The beta rays are more penetrating than the alpha particles. They are identical with the cathode corpuscles of the Crookes tube, except that they are traveling at a much higher speed.

The gaseous residue of radium,—called the emanation, will not be discussed in this paper.

The gamma ray of radium, unlike the other two, is not a material particle, but is the result of violent electrical disturbance within the atoms. Just as x-rays are produced by the impact of cathode corpuscles upon the metallic target, so the gamma rays are probably the result of the impact of the beta rays (which are the same as high-speed cathode corpuscles), against the other radium atoms. The gamma ray is a light ray, and when the physicists have determined what light rays are, we will know what gamma rays are. We know that visible light rays, ultraviolet rays, x-rays, and gamma rays are all akin, varying only in the shortness of their wave lengths. The visible light rays have a wave length from 8000 Angstrom units for red light to 3500 in the violet and 2000

in the ultraviolet; x-rays have a wave length of 8 to .5 A units; while gamma rays have a range from 1.2 to .07.

Whenever x-rays or gamma rays strike an atom of matter a negative electron is dislodged from that atom and shot off—an ion being formed. The shorter the wave length of the ray, the greater the velocity of the dislodged electron. The gamma rays of radium are the most penetrating of any known rays, and will pass through several inches of lead. There are now being manufactured electrical apparatus which will develop x-rays of a penetration approaching that of radium. This requires x-ray tubes which will allow the passage of a current with a potential above 200 kilovolts, and this will only give a ray equal to the least penetrating gamma ray.

Since all electrons are alike, so far as we know, those dislodged by x-rays or radium from atoms which they strike are the same as the beta rays of radium. So that one of the effects of gamma rays in passing through matter or living tissue is the manufacturing of beta rays in its track.

The cells of living tissues, made up of very complex molecules which consist of atoms of various elements, share with all matter the effects of exposure to radioactive energy. In living tissue, these effects are much more marked, because the changes produced are more striking.

The alpha particles cannot penetrate beyond the superficial layer of tissue cells. However, since more than 90 per cent of all the rays from radium are alpha particles, those cells which are exposed to alpha bombardment are profoundly affected. We do not yet know just what is done to the protein molecule either by the positively charged helium nucleus (alpha ray), the negatively charged electron (beta ray) or the energy of the gamma ray. Whether the ionization of the simpler atoms results in new chemical combinations which, if carried far enough, will

cause death of the cell, we are not certain. We do know that the most profound effects are exerted on the cells which are least differentiated. That is, those cells whose energy is expended chiefly on growth or reproduction, rather than function—such as sperm cells, lymphoid cells, vegetative tumor cells, are most easily affected. These effects may be of varying degrees. When applied to a limited degree, the functional activity of the cells of secretory glands are stimulated. If applied in larger measure, there is destruction of the power of reproduction, or molecular degeneration in the cells.

In practical use, the gamma rays are used almost exclusively. The alpha particles are filtered out because their energy would so quickly destroy the superficial cells. The beta particles are filtered out because the gamma rays will produce the beta particles in the tissues, and the beta rays of radium are of limited penetration. In applying radium to human issues, the radium salt is enclosed in a glass tube, hermetically sealed. The glass filters out or stops the alpha rays. This tube is enclosed in a metal capsule which filters out the beta particles. Since the gamma rays, in passing through the metal of the capsule, forms beta rays on the outer surface of the metal, this metal capsule is enclosed in a rubber tube to filter out these secondary b-rays. When a cancer is treated, advantage is taken of the fact that the cancer cell is a vegetative cell only slightly differentiated as to function. This type of cell is more easily killed by any physical or chemical agent than is the normal tissue cell. So, by subjecting the cancer cells to a dosage sufficient to kill them, but not sufficient to kill the tissue cells, we can frequently eradicate the cancer. A high degree of technical skill and judgment is required to accomplish this. For example, if a cancer is situated beneath the skin and is to be attacked with radium, the rays with which we attack the cancer must be passed through the skin without in-

jury to that structure and be delivered into the cancer in sufficient quantity to kill the cancer cells. Since the energy of the gamma and all other light rays decreases in ratio with the square of the distance traveled, in order to deliver a sufficient dosage into the most distant portions of the cancer, it may be necessary to approach dangerously near the tolerance of the skin for the rays passing through it. It is not to be wondered at that some skins are burned with radium and x-rays; the marvelous thing is that many more are not injured. The skin is protected, to some degree, by estimating the proportion of the gamma rays which will be of low range, and filtering these out by interposing some substance between the radium and the tissues to be protected.

The treatment of cancer by radium through its destructive effect, is now an old story, and will not be discussed at this time.

MARICOPA COUNTY MEDICAL SOCIETY

The cordial and generous invitation of the Sisters at St. Joseph's Hospital to donate quarters for the Society has been accepted by the officers. In the future, the Society will hold their meetings in the lecture room of the Hospital on the first and third Saturday evenings of the month. The County Society library will be located in the old dressing room for the doctors, just east of the main entrance. The books and magazines have been placed in the room and arranged for the use of the medical profession. About forty magazines are available and more will be provided. The library has a toilet and bathroom attached and its convenient location will soon make it of great value.

The first meeting of the season was held on October 21st, with a very good attendance. Several matters of routine business were disposed of, and announcements of the program for the winter given by the Secretary, Dr. Fred Holmes.

Dr. R. J. Stroud, of Tempe, showed two very interesting clinical cases. The first one was an echinococcus cyst of the liver, diagnosed sterile at present. The second was a tuberculosis involving the periarticular structures of the knee, following trauma, diagnosed as a primary tuberculosis of the muscle or tendons about the knee joint.

Dr. Warner Watkins read a paper on "Malta Fever", introducing a discussion on the recent epidemic of this disease in Phoenix. At least thirty cases have been recorded. The source of the infection was soon found and eliminated by the health authorities, the epidemic lasting about ninety days.

On November 2nd, the Maricopa County Society had the pleasure of entertaining Dr. E. C. Rosenow, head of the Research Department of the Mayo Foundation. Dr. Rosenow was en route to Los Angeles to appear before the Southern California Society and stopped off at Phoenix. On account of train connections, it was necessary to hold a noon meeting. Notices were sent to all the doctors in the state and quite a number from outside the county attended the meeting. The subject being one which is of interest to dentists, invitations were extended the dentists of the state to attend, and they responded very cordially.

Following a luncheon at the Adams Hotel, at which nearly a hundred physicians and dentists were present, Dr. Rosenow gave his lecture on "The Production of Nephritis and Nephrolithiasis in Dogs by Devitalization of Teeth and Insertion of Organisms Isolated From Cases of Nephritis." He also spoke briefly on "Epidemic Hiccough and Its Production by Injection of Organisms Isolated From Human Cases." Both subjects were well illustrated by lantern slides.

Among the visiting doctors present were Dr. R. D. Kennedy of Globe, Dr. Sawyer of San Carlos, Dr. O. D. Wilson of Prescott, Dr. E. S. Miller of Flagstaff, Dr. Taylor of Camp Verde.

On account of Fair Week and the recent meeting with Dr. Rosenow no meeting was held on the regular meeting night (November 4).

ST. JOSEPH'S HOSPITAL, PHOENIX

The meetings of the staff of St. Joseph's Hospital, at Phoenix, began in October. The first meeting was held on Saturday night, October 14. Dr. Milloy presented the clinical record of an interesting medical case, with details of physical examination, laboratory findings and course of disease. This patient had died and autopsy findings of Dr. Mills were given. It was primarily a case of arteriosclerosis, with secondary kidney changes and terminal acute infection of kidneys, lungs and spleen.

The clinical manifestations of malta fever were discussed, using the records of two or three cases who had been for several weeks in the hospital.

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Information of interest to all readers, together with directory of officers of the constituent societies and the Board of Managers of this magazine, will be found following the Table of Contents on pages 1 and 2 of the Advertising Section.

Editorial Staff

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DR. J. W. ELDER, Albuquerque, New Mexico.....	Associate Editor
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THE SOUTHWESTERN MEETING

The medical event of the year, which is the annual session of the Medical & Surgical Association of the Southwest, will be in El Paso, on Dec. 7th, 8th, and 9th. The chairman of the Program Committee, Dr. H. H. Stark, is not yet able to announce the complete list of papers, but three of the visiting essayists will be the following:

Dr. Chas. L. Lowman, of Los Angeles, will show a motion picture film on the subject of locomotion, illustrating various abnormal gaits with both the usual speed and the low speed camera.

Dr. J. Curtis Lyter, of St. Louis, will have a paper on "Some Experimental Aspects of the Physiology of the Mediastinal and Pulmonary Lymphatics."

Dr. Rex Duncan, of Los Angeles, will have a paper on "Grading of Epitheliomata and their Radiosensibility."

The full program will be mailed to the profession of the southwest in advance of the meeting.

The usual program of clinics in the forenoon and scientific papers in the afternoon, with social gatherings in the evening, will be followed.

EE PASO COUNTY MEDICAL SOCIETY

The El Paso County Medical Society met in regular session on September 18th with 42 members and 7 visitors present.

Drs. E. D. Price and G. Werley reported a case of a woman, age 19, who gave a history of rheumatism and whose present condition had been diagnosed as tuberculosis. When seen by Dr. Price on September 9th she gave a history of having had several chills during past few days, general weakness, loss of weight, elevation of temperature, in general, the usual symptoms of tuberculosis. Examination revealed nothing abnormal in the lungs. The heart, however, was enlarged, and a systolic murmur could be made out at the apex and the spleen was enlarged. Blood count showed 2,500,000 reds, 16,000 whites with 87 per cent polynuclears. The Wassermann was negative. A blood culture on the third day showed the presence of streptococcus viridans. The whole picture was that of a classical case of subacute streptococcal endocarditis and death resulted on September 15th. A partial autopsy was obtained which showed normal lungs, and enlarged heart with the typical vegetations on the mitral valve and to a less extent on the aortic valve. The heart was demonstrated by Dr. G. Turner.

Dr. R. L. Ramey read a paper "The Treatment of Compound Fractures", in which he advocated giving immediate attention to all compound fractures and in his hands the following procedure has given excellent results: He anesthetizes the patient, thoroughly cleans the wound with soap and water and, if badly lacerated, practices debridement. Ether is then freely used in the wound followed by one-half strength Tr. Iodine. The wound is only loosely closed with drainage provided and dressings and splints very loosely applied after getting the fragments in proper alignment. He does not believe in plating compound fractures except in rare instances when the fragments will not stay in alignment, and neither does he believe it good surgery to tightly close the wound.

Dr. Ramey's paper was discussed by Dr. W. L. Brown, who stated that wounds such as

just described are ideal for the use of Dakin's solution and that in his opinion the early temporary splinting by means of plates, etc., is justified in cases where deformity is liable to result.

Dr. B. F. Stevens, in discussing the paper, called attention to the use of anti-tetanic serum and stated that Ivory soap and water will remove infections and that lately he has been getting good results from the use of Mercurochrome.

Dr. K. D. Lynch read a paper, "Some Observations on Kidney Infections", in which he recounted briefly the average run of kidney cases as seen in general practice, taking up in order Pyelitis, Pyonephrosis, Tubercular Kidney, Cortical Infections, Septic Infarcts and Abscess. Many cases of Pyelitis, he stated, are diagnosed as stone because of the blood in the urine and pain over the affected kidney. In ordinary Pyelitis cases cure is effected by pelvic lavage except in the presence of stone and stricture. When these conditions are corrected it is found that the infection yields rapidly as in simple and uncomplicated cases.

In tubercular kidney, Dr. Lynch believes it is advisable to lavage with $\frac{1}{2}$ to 5 per cent phenol even in those cases where it is intended to remove the kidney. Certain cases seem to improve under lavage and cure may be effected. In support of this statement three cases were reported that had been apparently cured by lavage, one case having now passed his seventh year without a return of trouble. He believes in conserving a kidney if possible. He has found it necessary in four cases to do a secondary ureterectomy after nephrectomy for tubercular kidney before the patients became well.

Cortical infections, in Dr. Lynch's opinion, are more common than ordinarily supposed and clear up without treatment unless they develop into abscesses. When necessary such infections as well as single and multiple abscesses are best treated medically and surgery resorted to only as a last resort. Some go on to chronic pyelitis and for those lavage is necessary after the acute symptoms have subsided.

Dr. F. P. Miller reported for the General Arrangements Committee for the past state meeting that all matters concerning the meeting, finances included, had been carried to a successful conclusion. The committee was discharged with a vote of thanks.

Leut.-Col. M. A. W. Shockley, the new Commanding Officer at the William Beaumont General Hospital, together with Major Chester R. Haig, of the Medical Section of the same hospital, were elected to honorary membership.

(This paper was part of the symposium on goitre before the Surgical Section of the Texas State Medical Association, at El Paso, May 10, 1922.)

Radio therapy is applicable only to the exophthalmic or hyperplastic and the toxic adenoma. All other forms should be treated surgically or medically. Holmes' classification is useful in selecting the kind of treatment, namely, (1) colloidal, cystic or simple goitre; (2) malignant goitre; (3) toxic adenoma; (4) nontoxic adenoma; (5) exophthalmic goitre.

In malignant goitre, if possible, surgery should be used, preceded and followed by radiotherapy.

Always there should be a thorough physical examination, since the hyperthyroidism may be a secondary manifestation of some focal infection; when menstruation is excessive without detectable pathology, raying the ovaries is indicated. Clinical improvement precedes a change in basal metabolism.

Syphilis of the Colon. J. P. Keith, M. D., Louisville, Ky. *Southern Medical Journal*, Vol. xv, No. 9, Sept., 1922.

Author's experience would incline him to the belief that syphilis of the colon is not so rare as the infrequent mention of it in the literature would lead one to believe. He gives three case reports. The main difficulty in diagnosis is between malignancy and tuberculosis; a gumma with ulceration may give a radiographic picture very similar to that of malignancy; where the syphilitic stricture is smooth, especially if it is multiple, the absence of pain and positive Wassermann are aids in differentiation. Tuberculosis usually involves the cecum and ascending colon, while syphilis is more likely to occur in the transverse and descending colon; syphilis does not have the intolerance to filling that tuberculosis has.

The Treatment of Cancer of the Breast. Frederick H. Kuegle, M. D., Sioux City, Iowa. *Minnesota Medicine*, Vol. V, No. 10, October, 1922.

Since even with the best of surgery, the ultimate history of breast malignancies is anything but encouraging, the attention naturally turns to the applicability of radiant energy as an adjuvant to surgery in such cases. The question is considered under three headings, namely, (1) as a pre-operative measure, (2) as a post-operative measure, (3) as a palliative in recurrent and inoperable cases.

From the best figures available, when a woman presents an established breast cancer with palpably affected axillary nodes, she has about one chance in 25 of being cured by operation. If extensive x-radiation is administered by approved modern technic, there will be marked recession of glandular enlargements, the cancer cells will be killed or encapsulated, the smaller lymph channels will be obliterated and tendency to metastases lessened. These are all desirable accomplishments, and if a period of three to four weeks are allowed to elapse, operation will be attended with a minimum risk.

SELECTED ABSTRACTS

Roentgen Therapy of Hyperthyroidism. I. W. Jenkins, M. D., Waco, Texas. *Texas State Jour of Med.*, Vol xviii, No. 4, Aug. 1922.

Statistics show that more than one-half of all operated cases recur within four years, so that any method of treatment which can be used as an adjuvant to surgery and which will retard this high percentage of recurrence, should be used. Every case of breast cancer which is operated and confirmed by pathological examination should, therefore, receive post-operative x-ray treatment. Properly administered this treatment will give definite results; any deep-seated cancer cells which have escaped the knife will be killed outright, or be so attenuated in virulence that they can become encysted. The operative scar will be rendered soft and pliable and entirely painless.

As a palliative in hopeless cancers, no other known treatment approaches the usefulness of radiotherapy in relieving pain, foul discharges and making the terminal stages comfortable.

Central Bone Tumors and Their Differential Diagnosis: With Special Reference to the Latent and Unhealed Bone Cysts in Adults. Joseph Colt Bloodgood, M. D., Baltimore, Mr. Minnesota Medicine, Vol. V, No. 10, October, 1922.

The author reported in the *Journal of Radiology*, for March, 1920, fifty-four cases of bone cysts, in six of which the onset occurred after the age of twenty. He again reviews these six cases, and propounds the question, "What shall be our procedure of attack when an adult comes under observation with an x-ray picture showing the central lesion with an intact bony shell, with or without evidence of a recent fracture?"

The possible central lesions are,—benign giant—cell tumor, central sarcoma, bone cysts, chondroma and myxoma, tuberculosis, chronic osteomyelitis, multiple myeloma, metastatic tumors, multiple primary central sarcoma.

When is exploration justifiable in central bone lesions with intact shell, with or without recent fracture? This refers to central lesions in patients over fifteen years of age. The unhealed bone cyst should be curetted. The central giant cell tumor does not require radiotherapy; it will not recur if curetted properly with chemical or thermal cauterization. If a chondroma or myxoma is revealed by operation, curetting with cauterization offers more hope than radiotherapy. If the rare central sarcoma is revealed by the operation, it would seem justifiable to curette with the cautery, with chemical disinfection, followed by radium in the bone cavity. If one explores a central tumor with an intact bony shell and is unable positively to rule out sarcoma, the treatment should be most thorough destruction with the cautery, then swabbing the bone cavity with pure carbolic acid and alcohol and 50 per cent chloride of zinc, following this by the introduction of radium; this to be followed up by post-operative x-ray and radium treatment.

BOOK REVIEW

THE SURGICAL CLINICS OF NORTH AMERICA, issued serially, one number every other month. Vol. LI, Nos. 1, 2, and 3, (Philadelphia, San Francisco and Chicago numbers), 882 pages, with many illustrations. Per Clinic year (Feb., 1922, to Dec., 1922.) Paper, \$12.00 net. Cloth, \$16.00 net. Philadelphia and London: W. B. Saunders & Company.

To the reviewer the Philadelphia Clinic number is one of the most interesting, as well as one of the most instructive along the lines of ordinary, every-day cases, that has appeared for some time. To realize this, one has to note that it contains clinics by Deaver, DaCosta, Ashburst, Frazier, and others not so well known, but who, nevertheless, present interesting subjects. The clinic of Dr. John B. Deaver seems to be a nearer approach to the pioneer work of Dr. John B. Murphy than any other we have seen; that is, it seems to carry more forcibly the personality of the clinician. Deaver's clinic dwells upon problems that may confront the surgeon any day, such as carcinoma of the breast, transperitoneal hysterotomy, recurrent cholecystitis, pyelotomy for renal calculus and an interesting cyst of the liver. One of these may be of particular interest because in this southwest country we meet an unusually large number of renal stones, probably due to the heavy intake of water with a considerable mineral content, necessary to supply the loss by excessive perspiration. The clinic on recurrent cholecystitis helps clear many difficulties. For example, he always tells why he uses drainage after cholecystectomy. Those who adhere to the fad of closing without drainage might read this with profit.

Any article by Charles H. Frazier will be gladly received, especially by those who have his new work on the spine and spinal cord. This clinic takes up brain tumors in relation to the cerebro-spinal fluid and ventricles. Ventriculography is discussed, together with problems that may arise on the operating table. Uses for the method of dehydration by sodium chloride that has recently come into use are explained and cisternal puncture is illustrated. The San Francisco number contains a clinic on a series of spinal cord tumors that has interesting features. Here is made the statement, probably correct, that most spinal cord tumor cases pass through from four to twenty hands before the diagnosis is made. Spinal cord compression is not difficult to diagnose if one simply remembers that increased patellar reflexes, paraplegia and a rather definite upper level of sensory involvement point toward the tumor. The great frequency of syphilis of the cord should not blot out the possibility of an occasional diagnosis of compression.

The Chicago number contains clinics on a wide variety of subjects. Following the operation of pyelotomy for stone in a floating kidney two years after nephrectomy on the opposite side, A. J. Ochsner discusses the measures that should be used in combating the re-

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currence of stone. While foods may have some influence the important point is the drinking of at least one-half gallon of distilled water every day. Personally, we believe the S. G. of the urine should be kept well under 1020 by the use of distilled water. Mix gives a methodical description of "dumping stomach" following gastro jejunostomy. Holstead uses transplants of fascia lata to replace defects in the dura. The writer has successfully used periosteum from the outer surface of the skull inverted for duroplastic repairs. A clinic of several cases of gun-shot wounds of the kidneys is followed by an extensive discussion of the types of injury and the treatment of each type, as well as the treatment of shock, hemorrhage and injuries to other viscera. This number also contains a case of tumor of the spinal cord by Bevan and his interesting observations. In connection with common duct obstruction he prefers to rely on external drainage rather than cholecystenterostomy because of the danger of infection ascending to the liver.

Kretschmer discusses traumatic kidney from the standpoint of the industrial surgeon. Valuable points are brought out in connection with hemorrhage, diseases present prior to injury, and liability due to wrong interpretation of x-rays. All together, the clinics for this half-year are probably the most interesting and instructive yet published. E. B. R.

TOO MANY DYPHTHERIA PATIENTS DIE

Why should there be any diphtheria mortality at all? Antitoxin is to this disease what water is to fire. The answer to the question is, therefore, that the antitoxin is not given soon enough or in sufficient quantity. Fire does not spread more surely or more rapidly among combustible materials than diphtheria in the tissues of the child attacked. The one supreme necessity is to head it off—put it out. A dose of 5000 units of antitoxin may or may not suffice. This dose should be the minimum; and it is far better to give 10,000 or 20,000 units in one dose than in two.

Nature is helpless in many of these cases; her defensive forces are simply overwhelmed by the poison of the disease. Give the patient a full dose, a liberal dose, of antitoxin, and as many as may be required; arrest the poisoning process; and then nature, relieved, rallies her phagocytic forces and destroys the invading bacilli.

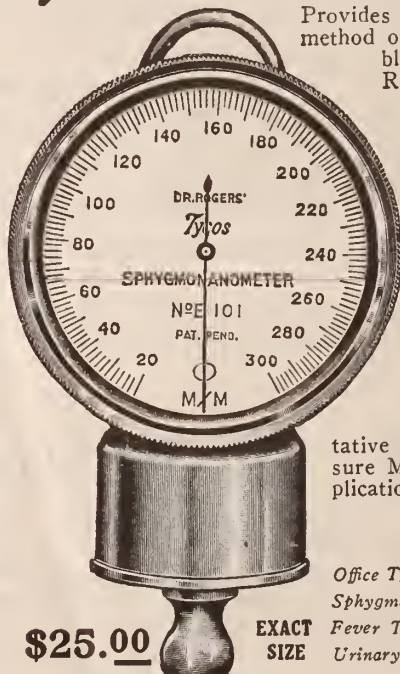
The mortality of diphtheria in this country, according to the Parke, Davis & Co. advertisement elsewhere in this issue, is 10 per cent. One patient out of ten dies. Save the tenth child.

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Members of the American Medical Association who are interested in this invitation are requested to write to the permanent secretary's office, Smithsonian Institution Building, Washington, D. C. They will thus secure a special invitation and a booklet of information regarding the American Association for the Advancement of Science.

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IMPORTANCE OF DIAGNOSIS IN SOME LESIONS OF THE GENITO-URINARY APPARATUS*

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So-called "silent lesions" of the genito-urinary tract occasion more mistaken diagnoses, and consequently, more unsatisfactory results, than any other diagnosable condition with which we have to deal. The adjective "silent" is a misnomer, however, as he who has his diagnostic ear attuned to the voice of the diseased kidney, ureter or bladder, will usually hear. As the human brain interprets the impressions which come to it over the auditory nerves, so must one's diagnostic judgment interpret the urological data furnished by the history, the urinalysis, the cystoscope and the x-ray. Urological literature at the present time is full of reports of diagnostic errors wherein other organs are blamed, and removed, when the real pathology lies in the genito-urinary tract.

It is needless to say that the appendix is the chief sufferer, is frequently decapitated, and recorded as a surgical cure, when the painful pathology lies elsewhere.

Next in frequency come the ovaries, whose actual or fancied pathology is made to account for the pain of kidney, ureteral or bladder disease. The gall bladder does not escape, but is also wrongly accused.

These patients, after operation, are partially relieved, probably because

of the enforced rest, diet and hygiene coincident with modern surgical methods. They are never absolutely cured. Although the pain because of which they were operated upon may not recur, still there is that lack of complete relief which we regard as proof of correct diagnosis. They drift away from the man who operated upon them, and come to correct diagnosis at the hands of the urologist, or on the autopsy table.

Accidental finding of blood or pus in the urine, or recurrence of pain, sends them to the urologist; or the pathologist finds unlooked for stones or neoplasm at post mortem. The urine may be absolutely negative, but a careful history will first direct attention to the genito-urinary tract. Symptoms may have been present for as long as forty years before a correct diagnosis is arrived at; and it is by no means uncommon to be told that the present complaint has been in evidence for from a few months to seven or eight years.

The honors for fooling the doctor are about equally divided between stone in the kidney or ureter, and pyelonephritis. Renal tuberculosis is next in evidence, to be followed by hydronephrosis and hydro ureter. Tumors of the kidney and congenital malformation may also simulate ab-

*Read before the Arizona State Medical Association, at Tucson, Arizona, April, 1921.

dominal disease. Nephroptosis, probably because it is easily diagnosed by palpation, or, when it is not thus easily found, is better left alone, does not furnish a large factor of error.

There are definite indications which call for a complete urological examination. First and most important of these is real abdominal pain which has remained unrelieved by one or more operations intended to produce relief. As a whole, the profession is becoming more fully aware of the possibilities of lesions of the genito-urinary tract as a source of diagnostic error and in the future this indication will not take first place. However, at the present time, fully fifty per cent of the total cases coming to the urologist for diagnosis have been subjected to one or more unsuccessful surgical operations. There is no disease of the abdominal viscera which may not be simulated by a urological condition, and while pain is the most frequent presenting symptom, what has been said of it is true of other conditions, such as vomiting. The presence in the urine of blood or pus, or hemorrhage from the urethra, should also require that the patient be subjected to a complete urological examination. That the profession is not fully aware of the importance of abnormal constituents in the urine is evidenced by recent health surveys in two of our cities, in which there were nearly twice as many x-ray examinations of the chest and Wasserman reactions run as there were routine urinalyses made.

The classical pain of kidney colic or stone most certainly calls for complete urological examination. This classical picture may be produced by blood clots or pus passing down the ureter, without stone being present. Although the eye in the bladder, through the cystoscope, may frequently guess at the pathology present, infection and hemorrhage are not to be differentiated from stone except by catheterizing the ureter, and injecting the pelvis with opaque fluid when necessary. It is only by pyelography that a pedunculated tu-

mor in the kidney pelvis, blocking the ureter and causing colic, is to be diagnosed.

Kidney stones and ureteral stones do not always give x-ray shadows which are characteristic. The uric acid stones cast negative shadows and usually cannot be detected by the roentgenologist. Such stones may pass into the ureter, block it partially or completely, and lapse into silence to be found a variable time afterward by the inquiring nose of the ureter catheter. After sufficient calcium is deposited in or around the stones they become visible on the radiograph (Fig. 1). Shadows simulating ureteral stone may be very close to the ureter area (Fig. 2) and opaque catheter is necessary to determine their relation to the ureter (Fig. 2a). By the injection of an opaque fluid through the catheter which has passed a stone or stricture, the amount of damage done to the ureter and kidney is easily measured with the aid of the x-ray (Figs. 3 and 4). Where one stone has come from, there may be others also, doing kidney damage (Fig. 5). Pyelography serves to determine if the factory is still working by localizing doubtful shadows, which might be stones, in the region of the kidney (Fig. 6), or by accentuating transparent stones with a halo of injected bromide solution.

The patient, as well as the doctor, is frequently satisfied when the pain of ureteral colic has subsided coincident with the passing of the stone into the bladder, where it may remain or be passed spontaneously. If it is not so passed very shortly after it reaches the bladder, it soon becomes too large to enter the urethra and remains as a foreign body in the bladder, where it gives rise to numerous symptoms. Stones in the bladder may be small (Fig. 7), and almost insignificant in symptoms; or they may be very large before they give rise to much trouble (Fig. 8). They are frequently embedded in the bladder mucosa and interfere more or less with the passage of urine. One was

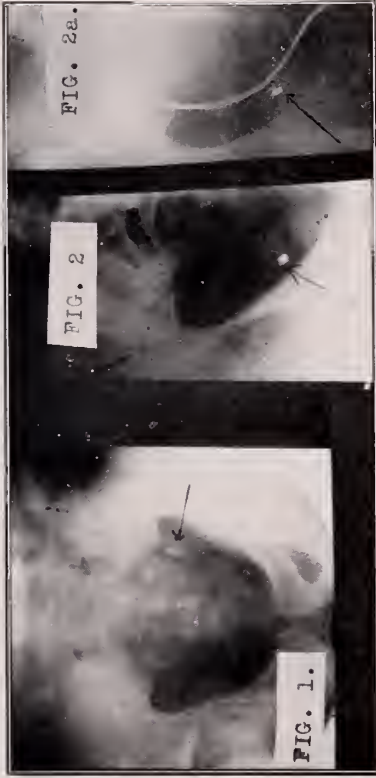


Fig. 1.—Stone in lower ureter of child, producing complete obstruction.
Figs. 2 and 2a.—Shadow suspected of being stone, oriented by opaque catheter in ureter; shadow not in line of ureter.

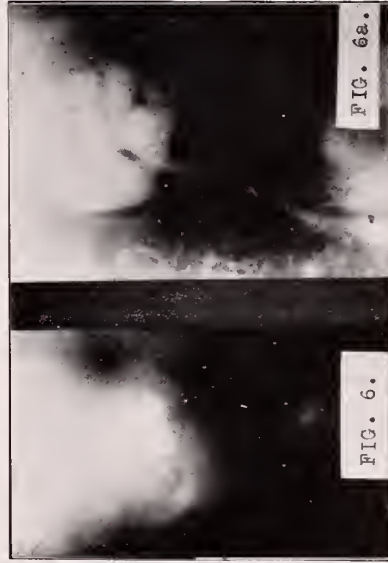


Fig. 5.—Stone in ureter, with a second stone in kidney pelvis, shown before and after injection of ureter.
Figs. 6. and 6a.—Stone in kidney pelvis, proven by injecting kidney pelvis, the opaque fluid surrounding stone. Kidney has hydronephrotic pelvis.

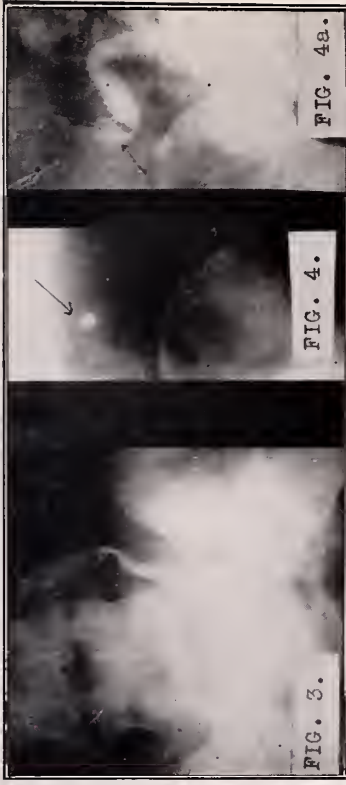


Fig. 3.—Ureteral stone, blocking ureter which is outlined with opaque fluid. There is a stricture at location of stone, a section stricture higher up, and a stone in kidney pelvis.
Figs. 4 and 4a.—Stone in ureter, near kidney, producing complete obstruction, with hydronephrosis. Stone shown before injection of ureter, and its location indicated by arrow in film made with ureter outlined.



Fig. 7.—Small, round stone in bladder.
Fig. 8.—Large, dense calcium stone in bladder, evidently of long standing but only recently producing symptoms.

found (Fig. 9) having a neck which would, at times, project into the urethra and block the passage. Stone is frequently suspected when a sound passed into the urethra is heard to grate over it or to produce a metallic click when the stone is touched. Nothing short of cystoscopic and radiological examination, however, is adequate to determine the exact size of the stone, and, what is more important, the preferable method of removal. A stone which is too large to crush with lithotrite will interfere considerably with complete cystoscopic examination of the bladder, and it is here that the cystogram is desirable. In doing cystoscopic examination of the bladder, the suspected stone may be highly refractile and must be differentiated from encrusted cystitis. A bladder stone of any size will cast a shadow when the light of the cystoscope is thrown upon it, or it may be turned from side to side with the catheter so that full appreciation of its size and shape may be gained.

Stone is only one of the conditions in the bladder in which radiography is valuable in completing the picture. In planning the surgical approach, a cystogram is frequently necessary to determine if the bladder shall be opened or attacked from the retroperitoneal aspect.

The normal cystogram (Fig. 10) is smooth, without filling defects, and variable in size. If the bladder is irritable, it may contract and permit the comfortable injection of only a small quantity of fluid. External structures may indent the bladder, but this must not be mistaken for intravesical pathology (Fig. 11).

A projection into the bladder of some structure outside it is very easily appreciated by the cystoscope as the normal mucosa of the bladder is seen to rise over the tumor mass.

Diverticuli of the bladder, unless located directly posterior to the organ, usually show very clearly and definitely in the cystogram (Fig. 12). They are single or multiple, and may vary considerably in shape and size.

Very large stones in the lower end of the ureter (Fig. 13) occasion the same symptoms as diverticuli, and may not be diagnosed except by cystoscopic examination. Indeed, the combined radiological and cystoscopic examination has its most necessary indication here. By passing the beak of the instrument into the diverticulum it is illuminated, its extent measured, and its contents seen, whether this be stone or pus.

Papillomatous growths of the bladder are to be suspected when the urine contains blood, and are to be thought of very strongly when anything like a profuse hemorrhage takes place from the urethra. Upon examining a bladder containing papilloma, the seaweedlike appearance of the growth is apparent at once. If the bladder is very full of these tumors, introduction of the cystoscope into this will be very like what would be seen if the ocular were pushed into a bunch of grapes; the glistening white surface of the papilloma reflects the cystoscope light and the growth itself may obscure the vision. By drawing the beak of the cystoscope away from the papilloma, a truer appreciation of its extent is obtained.

The cystogram shows filling defects, usually small serrations (Fig. 14) if the growth is along the vault; if on the floor, the cystogram may show nothing.

Cancer of the bladder shows cystographic and cystoscopic peculiarities which are characteristic. The cystogram shows (Fig. 15) filling defects analogous to those found in the barium filled stomach, which contains new growth. While this is true of carcinoma which has attained any considerable size, early diagnosis of carcinoma must be made by the appearance of the mucosa through the cystoscope, and is very difficult at times.

Small amounts of pus, in the voided specimen from the male, are of little significance unless an antecedent gonorrhea is eliminated. Pus in the catheterized specimens in a male who

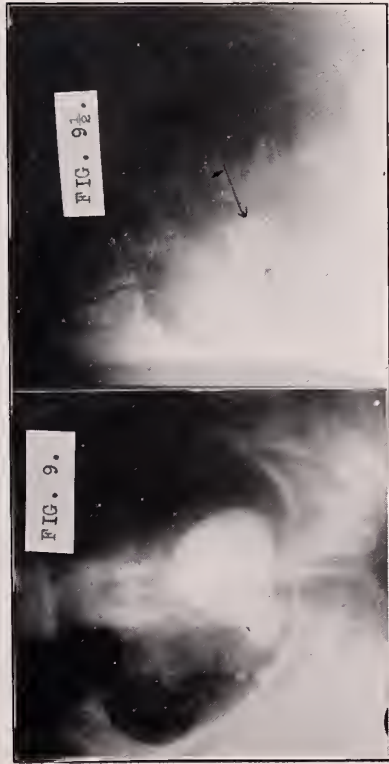


Fig. 9.—Large bladder stone, with conical shape, the small end producing intermittent obstruction by falling into the urethra.
Fig. 9½.—Shadow diagnosed as bladder stone, but which proved, at operation, to be a calcified fibroid in anterior wall of uterus. Shows necessity for cystoscopy in such cases.

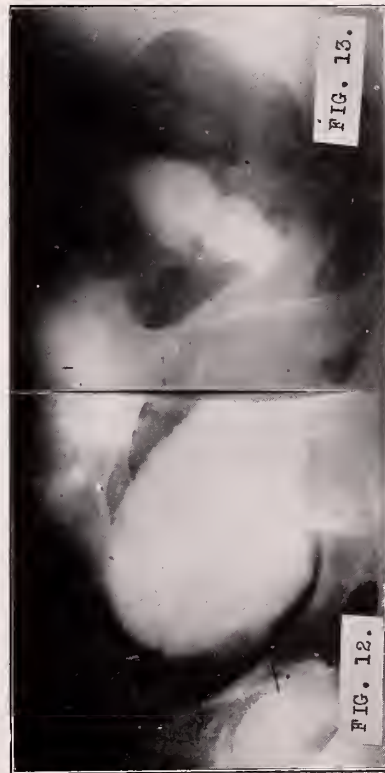


Fig. 12.—Two large diverticuli of the bladder.
Fig. 13.—Group of large stones which were entirely within the lower ureter, not being visible, nor removable, from the inside of the bladder.



Fig. 10.—Normal, smooth, round contour of cystogram.
Fig. 11.—Normal cystogram, the indentation in the outline being produced by external pressure.

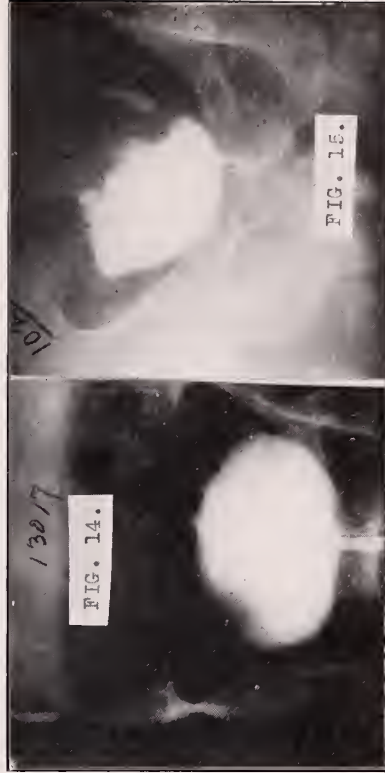


Fig. 14.—Cystogram of a papillomatous bladder; note the serrated outline along the upper surface, being the filling, defects of the papillomatous growths.
Fig. 15.—Cystogram of bladder carcinoma, showing the deformity of outline, the marked filling defects, the absence of shadow where tumor projects into bladder, and the ureter partly filled.

denies gonorrhea is suggestive of a lesion in the kidney or ureter and calls for complete cystoscopic examination. In those cases in which the previous history of gonorrhea is obtained, it is very interesting to demonstrate the location and extent of the urethral damage by opaque fluid. The normal urethra (Fig. 16) is fairly regular in size, and usually dilates when the patient strains, with the meatus closed during radiography. Under these circumstances, stricture of the urethra is nicely shown (Fig. 17) and its degree and extent estimated. Stricture, naturally, must be dealt with before cystoscopy can be successfully carried out.

Having, then, excluded gonorrhea as a source from which pus in the urine comes, we must consider from what other sources it might spring.

Stone in the kidney is usually the first thought of the general practitioner, especially if there is any pain referred to the kidney. While nephrolithiasis is relatively unimportant, as compared with the other lesions of the kidney, it should always be examined for. Unfortunately, many kidney stones do not cast shadows on the radiographic film. Only the calcium stones cast recognizable shadows. The kidney outlines can usually be shown in a properly made radiograph (Fig. 18), and frequently the plain films will show stones—which may be either small (Fig. 19), or quite large (Fig. 20).

The chief danger from kidney stone lies in their tendency to pass into the ureter (Fig. 21), where they may lodge and become a very painful and dangerous condition. The common result of stone which remains in the ureter for any length of time is a hydronephrosis, which is brought about also by the kinking of the ureter, or from infection entirely independent of stone. Outline of the kidney pelvis and ureter by opaque media is absolutely necessary to the fullest appreciation of the extent of the hydronephrosis. In order to understand the variations produced in the pyelograms of hydronephrosis, it

is necessary to appreciate the normal kidney pelvis, which varies considerably in size as well as shape.

The normal kidney pelvis may occur in several forms, the chief of which are the following: (1) The typical pelvis, which has only an upper and lower calyx (Fig. 22). (2) The branched pelvis (Fig. 23), where in addition to the upper and lower calyces there is a middle calyx; this middle calyx may empty either directly into the pelvis or may join one of the other calyces, usually the lower. (3) The hemipelvis (Fig. 24), in which the lower calyx is large, practically taking the place of the pelvis, receiving several secondary calyces, and the upper calyx is poorly developed, sometimes joining the lower by a narrow passage. (4) The ampullar type (Fig. 25) of pelvis is one in which there are no major calyces, but a number of minor calyces entering directly into a somewhat rounded and roomy pelvis. (5) The infantile type is a small, undeveloped pelvis, practically a continuation of the ureter (Fig. 26). (6) A rare type is that in which there is a principal pelvis which communicates with secondary pelvises, which latter, in turn, communicate with the major calyces.

The pelvis may hold from three to eight c. c. of fluid, with ten c. c. as the extreme normal limit. It is usually roughly pyramidal in shape, but its shadow may appear somewhat rounded, if any pressure is exerted in the injection of fluid. The calyces should be well outlined. The ureter varies much in size, depending also on the amount of pressure exerted.

The pyelographic evidence of hydronephrosis (Figs. 27-32) is a dilatation of the pelvis and calyces, the latter being enlarged, and rounded instead of being pointed or serrated. The cause of the hydronephrosis is ureteral obstruction, whether due to simple kinking, to stone or to stricture. Kinking of the ureter usually occurs in the upper three or four inches. This may result in nothing more than critical pains, and when



Fig. 16.—Outline of a large, normal urethra, filled by the patient attempting to void the opaque fluid injected into the bladder, while external meatus is held closed.

Fig. 17.—Stricture of the urethra just posterior to bulb, extent of which is outlined by opaque fluid injected into the bladder and forcible attempt to void made, while meatus is held closed.

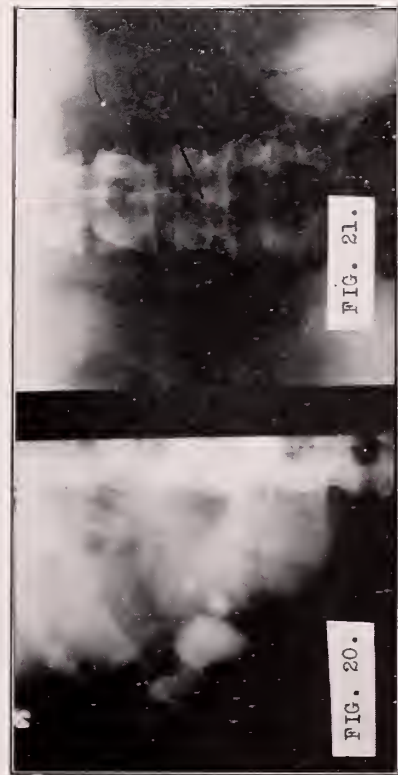


Fig. 20.—Group of large kidney stones, producing very mild symptoms.

Fig. 21.—Ureteral stone shortly after its passage into ureter. Patient was having ureteral colic. Stone passed into bladder about 48 hours later.

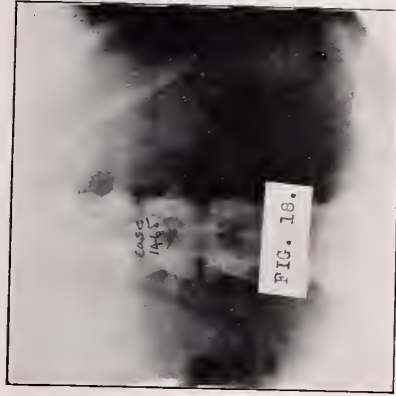


Fig. 18.—Normal radiographic outline of kidney. Figs. 19 and 19a.—Small kidney stone, shown to be in lower pole of kidney, by injecting pelvis, for orientation.

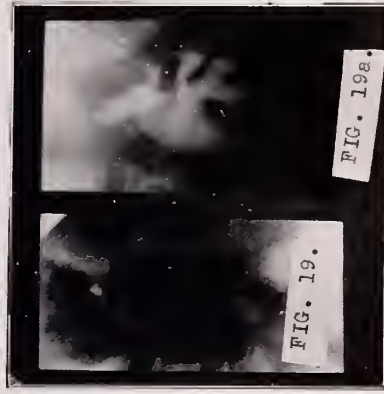


Fig. 22.—Normal Type I kidney pelvis, with upper and lower calyces.

Fig. 23.—Normal Type II kidney pelvis, with upper, lower and middle calyces. The middle calyx may join the upper or the lower calyx, or may enter directly into the pelvis.

due to simple mobility of the kidney may not be sufficiently continuous or permanent to produce dilatation of the pelvis and hydronephrosis.

Stricture of the ureter is caused by scar tissue as the result of trauma from stone, or as the result of infection. The degree of hydronephrosis will depend on the length of time it has existed and the completeness of the stricture.

Pyonephrosis, which results as a sequence of hydronephrosis and is, therefore, dependent upon the same causes, is not to be diagnosed from hydronephrosis by the x-ray, but is proven to be present when the return through the ureter catheter is purulent.

Tuberculosis of the kidney is to be suspected whenever the urine contains blood or pus. Radiographic methods are of less value than cystoscopic examination, although calcifications of old tuberculosis are sometimes found (Fig. 33), and when cavities are formed these may communicate with the pelvis and be filled by the opaque fluid in pyelography (Figs. 34 and 35). Slight variations from the normal cystoscopic appearance require further examination. Early in kidney tuberculosis there is produced an area of redness and edema around the ureteral orifice. If nephrectomy is done, this redness and edema will subside. Later actual infection of the bladder with the formation of tubercles occurs. It is of the utmost importance to determine whether the bladder tuberculosis is secondary to a renal lesion or to genital tuberculosis, particularly in the male. The finding of tubercle bacilli in the urine secured through ureter catheter is conclusive evidence that the kidney is tuberculous.

It is beside the scope of this paper to enter into the diagnosis of lesions in the genital tract except to say that they should be excluded. It is very important to be sure that both kidneys are not tuberculous before proceeding to remove one of them.

Having excluded kidney tuberculosis and stone as the source of blood,

with or without pus, in the urine, tumor of the kidney should be suspected. Diagnosis of kidney tumor during the operable stage taxes all the ability of the urologist. Spontaneous hemorrhage through the urethra, if the bladder does not contain new growth, should always arouse suspicion of kidney tumor. Formerly the presence of tumor cells in the urine was considered the best evidence of new growth, but this method is no longer regarded as reliable. It has recently been said that trauma of the kidney pelvis by means of the ureteral catheter, if it produces bleeding, is diagnostic of tumor. However, bleeding from a normal pelvis is easily produced by a catheter introduced too far, and should not be considered pathognomonic of tumor. Plain radiographs of the abdomen, properly taken, will usually show the kidney outline, and the outline may be so normal in position and size as to rule out gross tumor (Fig. 18). If there are variations in the normal un-injected kidney outline, or if there are irregularities in the shadow of the kidney pelvis on the pyelogram, these are strongly suggestive of tumor. If the kidney tumor is large, it will usually displace the pelvis (Fig. 36). Should the usual pyelographic methods fail, or if the ureter is blocked so that the catheter cannot be introduced, the kidney may be beautifully shown by pneumoperitoneum or perirenal emphysema. In pneumoperitoneum the peritoneal cavity is inflated with a gaseous medium (oxygen, carbon dioxide or plain air), and the kidney examined under the fluoroscopic screen or by radiographs. In perirenal emphysema, the fatty bed of the kidney is infiltrated with oxygen until the kidney stands out in a bed of gas, its contour being plainly visible by x-ray methods.

Illustrating the methods outlined, the procedure pursued in a recent case referred because of spontaneous brisk hemorrhage through the urethra, is outlined. Normal cystogram was obtained (Fig. 37). Cystoscopic



Fig. 24.—Normal Type III kidney pelvis, the lower calyx being well developed and practically takes the place of the pelvis, while the upper calyx is poorly developed.

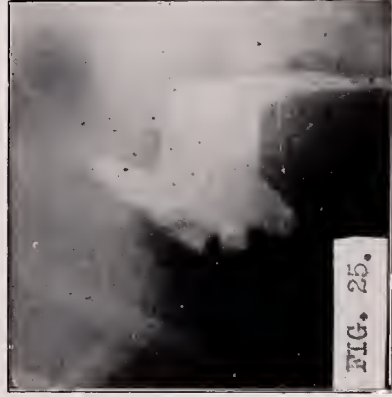


Fig. 25.—Normal Type IV kidney pelvis,—the ampullar type, with large, pyramidal pelvis, receiving several calyces directly. Must not be mistaken for beginning hydronephrosis.



Fig. 26. Normal Type V kidney pelvis. The infantile or undeveloped type, which appears like an extended ureter, branching directly into calyces. It is usually of small volume and can easily be overdistended.

Fig. 27.—Beginning enlargement of a kidney pelvis of Type III shape, produced by contracture of ureter below. There is rounding of the calyces, slight increase in capacity, and the ureteral stricture was demonstrable under the fluoroscopic screen.

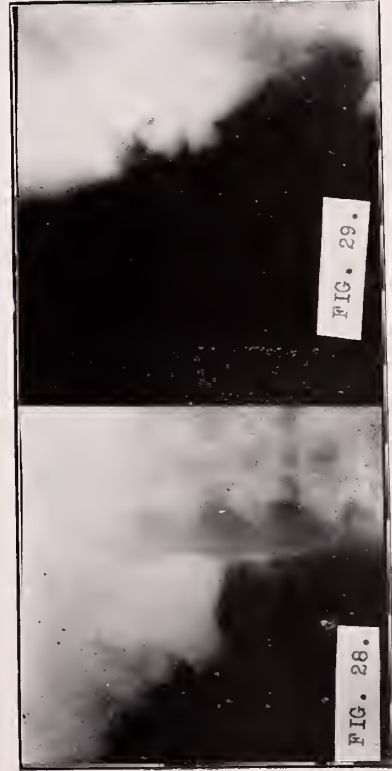


Fig. 28. —Fairly well advanced hydronephrosis from stricture of the ureter shown just below the pelvis.

Fig. 29.—Hydronephrosis from ureteral stricture low down; pelvis markedly dilated and rounded.



Fig. 30.—Moderate degree of hydronephrosis from ureteral obstruction.

Fig. 31.—Pyonephrosis, following ureteral obstruction, produced by stone. Has the same characteristics as hydronephrosis.



Fig. 32.—Hydronephrosis of moderate degree, produced by ureteral kinking from loose kidney. Note position of kidney pelvis.



Fig. 34.—Extrapelvic shadow, probably the pocket of an old tuberculous abscess which has opened into the kidney pelvis.

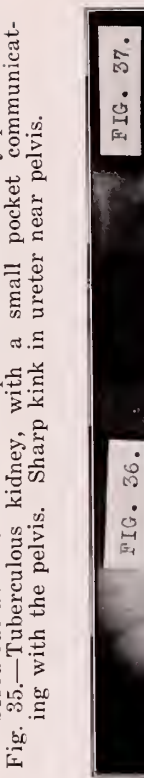


Fig. 35.—Tuberculous kidney, with a small pocket communicating with the pelvis. Sharp kink in ureter near pelvis.



Fig. 38.—Normal Type III pelvis in same case as Fig. 37.



Fig. 36.—Displacement of pelvis from enlargement of kidney (tumor?). Note the direction and point of entrance of catheter into the kidney pelvis. Marked hydronephrosis.

Fig. 37.—Normal cystogram in a case of kidney tumor.

examination showed a small trickle of blood emerging from the left ureteral orifice. The right ureter was found and catheterized, and normal kidney pelvis outline shown by pyelogram (Fig. 38). An obstruction or

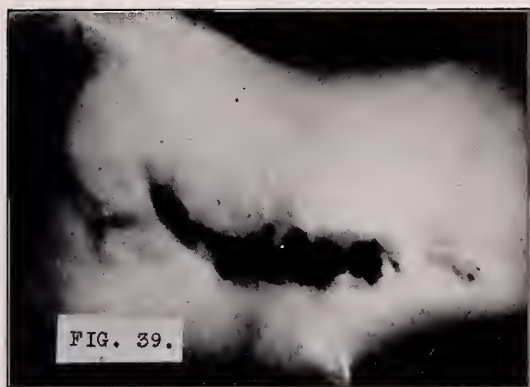


Fig. 39.—Lateral view of abdomen of patient with peritoneal cavity inflated with oxygen (pneumoperitoneum); patient is supported with pendant abdomen, gas outlining the prevertebral spaces and showing outline of much enlarged kidney on left side.



Fig. 40.—Antero-posterior view of same patient as Figs. 37-38, with pneumoperitoneum. Liver, spleen and both kidneys outlined; left kidney much enlarged, extending down to pelvic brim.

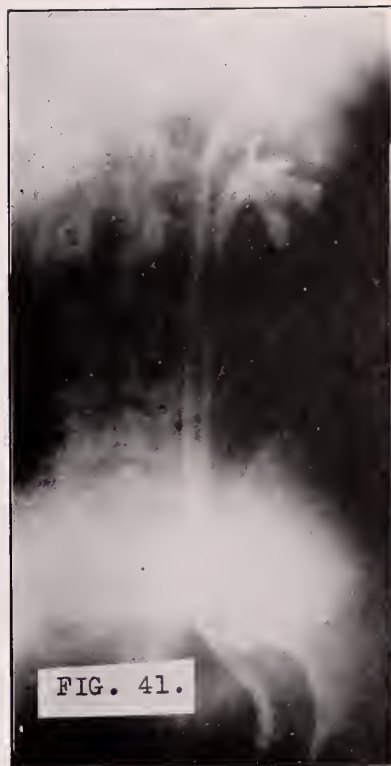


Fig. 41.—Double ureter, with two separate kidneys on the same side, with a different excretion time for phthalein, showing them to be separate structures entirely.



Fig. 42.—Ureter branching at its entrance to the pelvis, the upper branch passing to a separate pelvis.



Fig. 43.—Double ureter, with two separate pelvises, one of which is markedly hydronephrotic, the other being of normal size and contour, though poorly developed.

obliteration of the left ureter was located about one-half inch from the orifice; this obstruction resisted two attempts at catheterization. Indefinite shadow in the left kidney region suggested tumor, and pneumoperitoneum was resorted to, followed by x-ray. After inflation of the peritoneal cavity with oxygen, the patient was turned in the prone position,

raised upon blocks until the abdomen was pendulous, and the gas had risen into the prevertebral space. Tumor mass was easily seen extending from the diaphragm to the pelvic brim (Fig. 39); antero-posterior examination showed the tumor even better (Fig. 40). A probable diagnosis of hypernephroma or sarcoma was made.

In routine pyelographic work, interesting and unexpected findings are frequently encountered. Branching ureters with double kidney pelvis may be discovered (Fig. 41). A double kidney is less frequently found; one was recently discovered (Fig. 42) in which the phthalein appeared in the urine from the upper pelvis in five minutes and from the lower one in twelve minutes, showing that the

blood supply and kidney structures were entirely distinct. In another case, one kidney pelvis showed marked pathology of hydronephrosis, while the other pelvis on the same side was practically normal (Fig. 43).

In conclusion, yet us urge you to be on the lookout for genito-urinary pathology, especially in doubtful abdominal conditions, and to make a practice of routine urinalysis in every case which presents itself to you for diagnosis, no matter how obvious the diagnosis may appear to be. Should there be any suspicion of pathology in the urinary tract, a thorough and comprehensive examination is indicated, utilizing the methods which have become thoroughly established as indispensable in urologic investigation.

CHRONIC AND SUBACUTE APPENDIX DISEASE*

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The late John B. Murphy prefaced one of his clinical lectures on appendicitis with the statement that, as long as the hospital mortality from operated acute appendicitis still approaches ten per cent, the subject will be a live one for discussion.

With regard to chronic appendicitis, as long as the subject remains the battle ground for opinions as widely divergent as human ideas can be, we may study the subject with profit and entertainment.

Reginald Fitz, of the Massachusetts General Hospital, introduced the term "Appendicitis" in 1886, and the medical world still wonders why someone did not conceive the idea earlier. Yet twenty years more passed before a comprehensive description of chronic appendicitis appeared (Klemm in 1906), and, today, in the same hospital, one of the greatest clinicians of this generation denies the existence of such a clinical condition as chronic appendicitis.

Richard Cabot¹ is the best-known exponent of the absolute negative in the gradations of medical opinion with regard to chronic appendix disease. He claims that, in his enormous experience, he has never yet seen a patient whose symptoms he could attribute to a chronic disease of the appendix. In his work on "Differential Diagnosis" he tabulates 15,000 cases of "chronic dyspepsia", in 12,600 of whom the gastric symptoms were due to conditions outside of the stomach; among such non-gastric conditions he does not list chronic appendix disease even as a possibility.

The literature on chronic appendix disease is enormous, there being three or four hundred articles in American journals alone, and time will permit only a mention of a few of the authorities. Among the writers whose views approach those of Cabot, without being quite so extreme, are Bevan², Williams & Slater³ and Con-

*Read before the New Mexico Medical Society, at Gallup, N. M., April 30, 1922.



Fig. 1.—Normal appendix, at 24 hour period, freely movable, without tenderness or other symptoms.

Fig. 2.—Normal appendix, at six hour period; freely movable, not sensitive or tender.

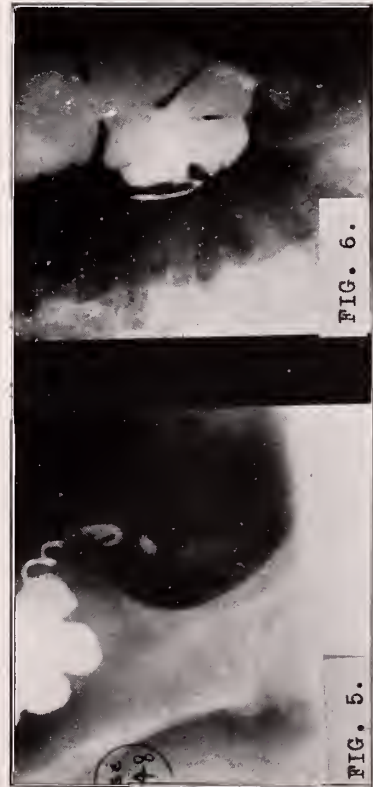


Fig. 5.—Long, coiled appendix, with slight filling defects; otherwise normal.

Fig. 6.—Short, kinked appendix, turned up and adherent to ileocecal valve region.



Fig. 3.—Retrocecal appendix in child, at 24 hour period; cecum nearly empty.

Fig. 4.—Short, blunt, retrocecal appendix, which was tender and painful; found in subacute stage at operation.



Fig. 7.—Long, slender appendix, turned upward behind and to outer side of cecum; adherent and tender.

Fig. 8. Appendix in stage of acute inflammation; short stiff and very tender; lumen imperfectly outlined, because of being already filled with pus (shown at operation).



Fig. 9.—Appendix coiled up in a mass of adhesions; very tender and painful; operation showed subacute infection.

Fig. 10.—Appendix adherent to cecum through half its length, with constricted areas, concretion defects, and showing definite tenderness to palpation.

FIG. 10.

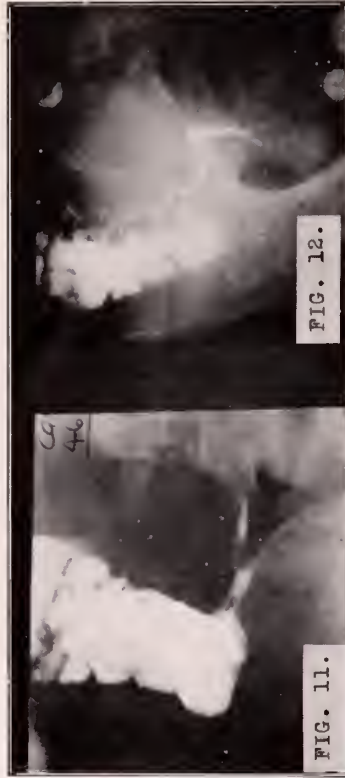


Fig. 11.—Appendix adherent to posterior abdominal wall, shown on stretch, with two concretion filling defects. Symptoms suggested stomach ulcer.

Fig. 12.—Appendix kinked and adherent, with concretion defects in tip. Symptoms typical of stomach ulcer, including several hemorrhages from stomach. When operated during an acute appendicitis attack, stomach was found normal, and all ulcer symptoms disappeared after operation.

FIG. 12.

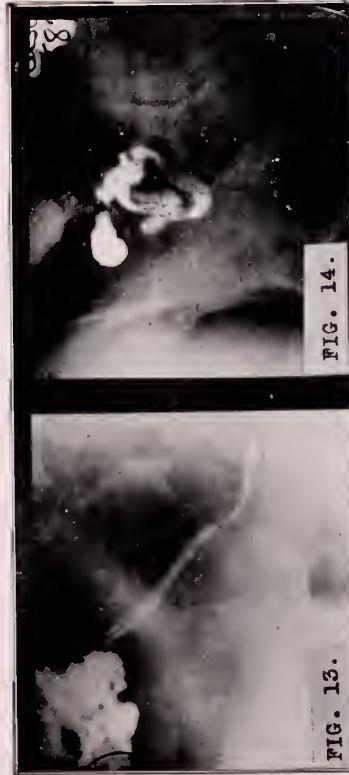


Fig. 13. A very long, imperfectly filled appendix, adherent in right side of pelvis, and very sensitive. Operation showed adhesion to right ovary and subacute infection.

Fig. 14.—A long appendix, adherent to head of cecum, showing several strictures and filling defects of concretions; tender and painful.

FIG. 14.

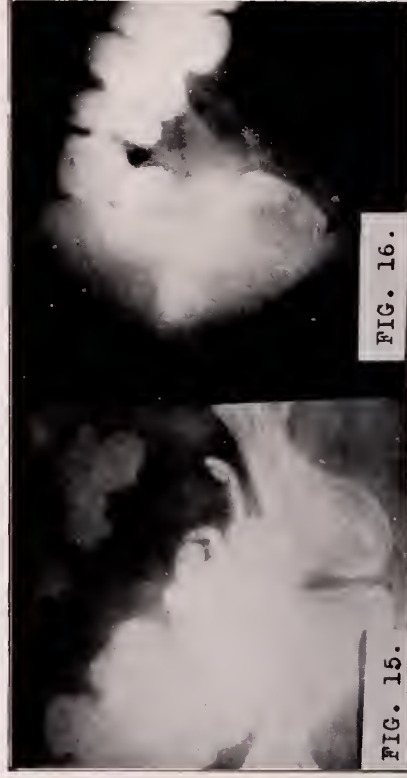


Fig. 15.—Cecum on floor of pelvis, with appendix firmly adherent to some structure in left pelvis; sharded kinked at the tip. Left sided pain.

Fig. 16.—Appendix turned upward and adherent to the transverse colon, deforming the cecum. Pain, tenderness, and stasis.

FIG. 16.

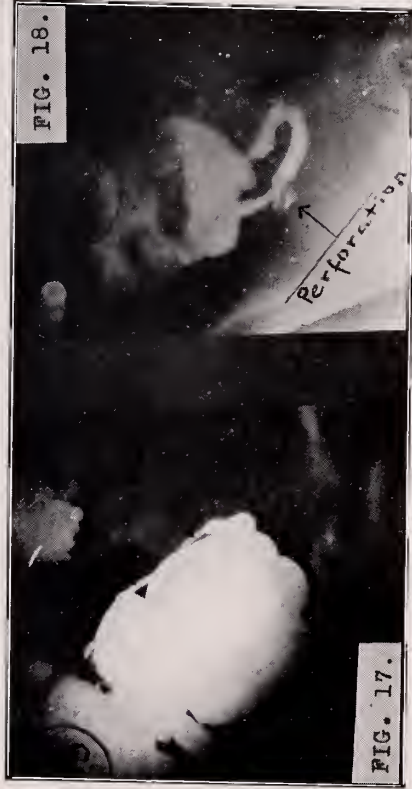


Fig. 17.—Appendix adherent along the inner border of cecum; irregularities in contour; definitely tender.

Fig. 18.—Appendix which shows an extra-appendiceal barium shadow, which was diagnosed a perforation. It proved to be so at operation, showing a walled off pocket at the point indicated.

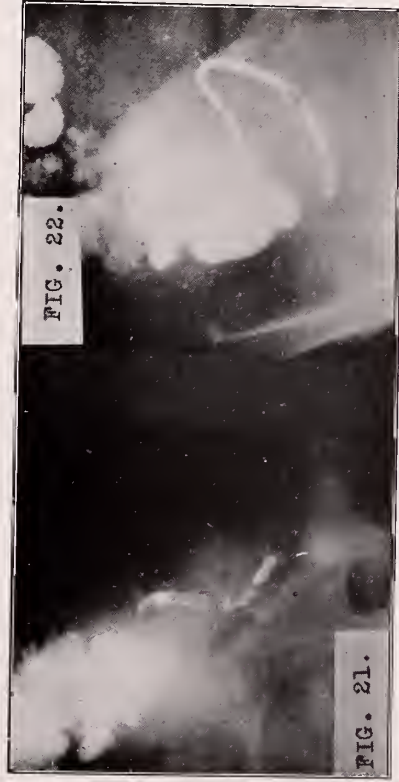


Fig. 21.—Very irregular filling of appendix lumen, with constricted points and concretion areas. Very tender.

Fig. 22.—Long, sensitive appendix, with two definite concretion defects distal to basal contraction of lumen.

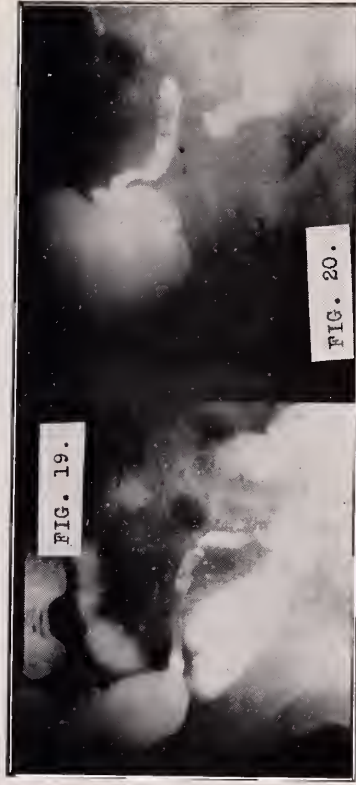


Fig. 19.—A very long appendix, at the six hour period. Shows several areas of irregular filling. It was movable, but was very tender. Clinical symptoms were gastric entirely.

Fig. 20.—Appendix with concretion in distal half, and constriction near base. Definitely tender. Clinical symptoms were gastric and suggested duodenal ulcer.

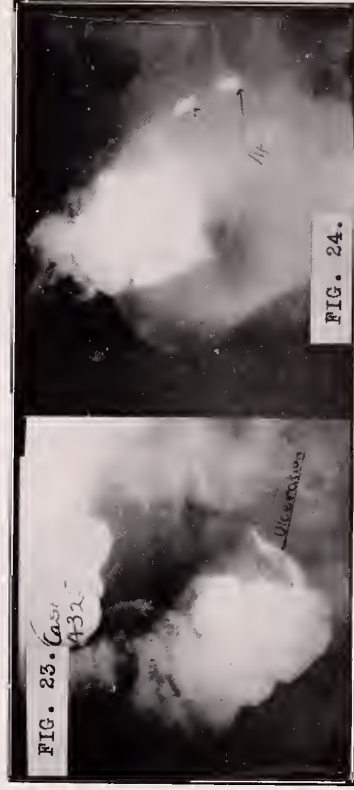


Fig. 23.—Appendix showing a filling defect which could be definitely diagnosed an ulceration in the appendix. Such areas may occur around fecaliths in the appendix.

Fig. 24.—A segmented appendix, with three sacculations filled with barium, and two large areas of contracture. Such an appendix, when tender and accompanied by clinical symptoms, is evidently pathological and probably infected at the time.

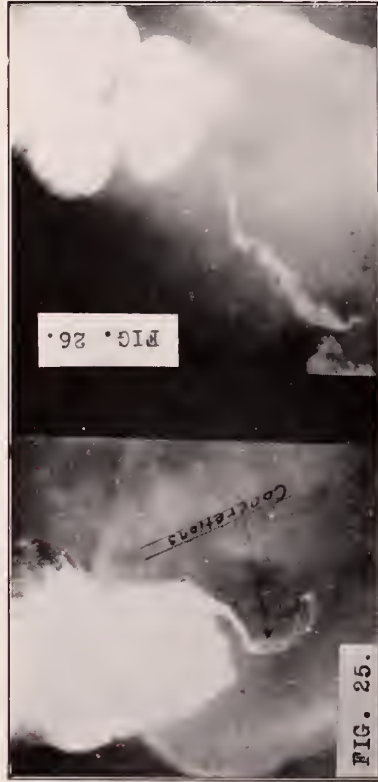


FIG. 25.

Fig. 25.—Appendix with concretions in the distal half and constricted proximal lumen. Tender and painful with reflex gastric symptoms.

Fig. 26.—A very long, irregularly filled appendix, with multiple constrictions and concretions. Adherent in pelvis (right tube at operation), tender and painful.

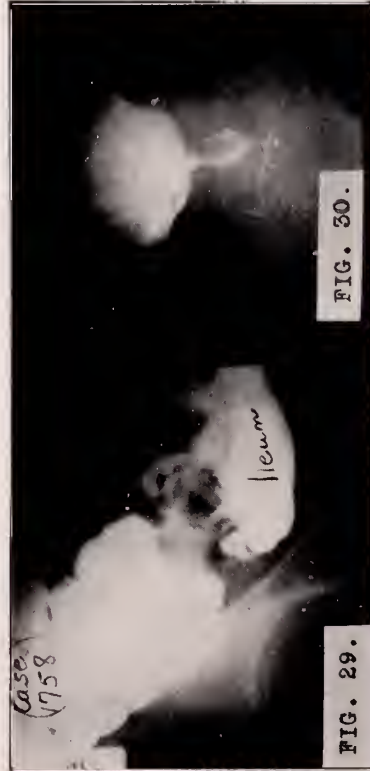


FIG. 29.

Fig. 29.—Tuberculous appendix, showing irregularities in outline. A short, blunt, stiff, tender appendix. Operative confirmation.

Fig. 30.—Tuberculous appendix; short, blunt, stiff and irregular in outline. Operative confirmation.



FIG. 27.

Fig. 27.—Appendix adherent opposite lower sacro-iliac joint. Much constricted in proximal two thirds, with large sacculaton and concretion in tip. Very sensitive. Found adherent to bladder at operation.

Fig. 28.—Very long appendix, extending into pelvis, but not adherent. Multiple concretions in distal half; Much constricted in proximal portion. Tender. Patient also had doudenal ulcer.

FIG. 31.

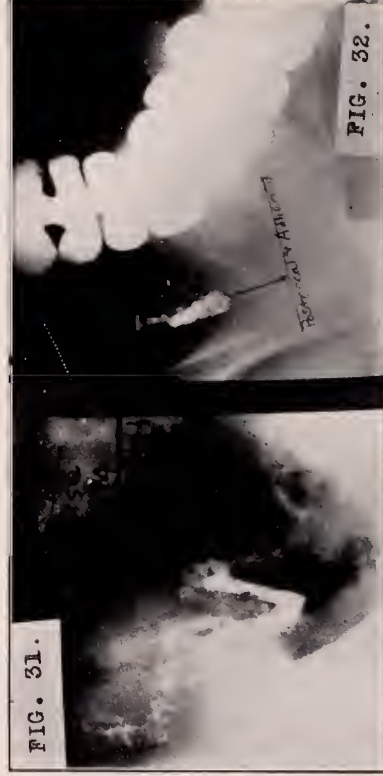


FIG. 32.

Fig. 31.—Tuberculosis of appendix and cecum. Taken at six hour interval, showing the hypermotility of cecum and intolerance to barium meal. Appendix kinked, adherent, and very sensitive.

Fig. 32.—Retrocecal appendix, probably tuberculous, showing irregularities in filling, with hypersensitive cecum, such as is found in tuberculosis of this part of the bowel.

nell⁴. At the opposite extreme are those who claim that any pathological change in the appendix, whether fibrosis, obliteration, adhesions, or inflammation, is an emergency demanding surgery. The midground, and probably the correct ground, is that held by such writers as Deaver⁵, Mayo⁶, Mohnihan⁷, Horsley⁸, Brewer⁹, Graham¹⁰, Stanton¹¹, Lichty¹², Cheney¹³, Bassler¹⁴, Brown¹⁵, Aaron¹⁶, and others. These recognize chronic appendix disease as a frequent cause of gastrointestinal symptoms, and recommend surgical relief, after comprehensive diagnosis.

With regard to the morbid anatomy of appendicitis, whether acute or chronic, we are on fairly uncontested territory, the work of Moschkowitz¹⁷ and MacCarty¹⁸ being generally accepted. The divergence comes on the question as to whether the pathological changes which are so frequently found are the cause of reflex symptoms. For our own satisfaction and instruction, the pathological work of Moschkowitz has been confirmed by my associate, Dr. H. P. Mills, on a series of appendices now numbering about 500. Our conclusions have not changed since Dr. Mills' pathological report two years ago¹⁹, and may be summarized as follows:

(1) Pathologically considered, chronic appendix disease is an end result and not an active process. When attacks of acute or subacute appendicitis subside, they leave sequellae of various sorts—fibrosis, strictures, kinks, adhesions. These, while not dangerous in themselves, may excite motor phenomena and reflex symptoms in the stomach and colon, or lead to recurring attacks of subacute appendix infection.

(2) It is immaterial, from the standpoint of the evolution of chronic pathological changes in the appendix, whether these recurring or primary infections come by way of the bowel lumen or through the blood stream. In either event, the first effect is upon the mucosa of the appendix, which becomes swollen and infiltrated with leucocytes; should the in-

flammation subside at this point regeneration may be complete without permanent damage. If inflammation continues beyond the first twelve hours, there will be a round cell infiltration of the submucosa and muscularis, with a peritoneal exudate; subsidence of the inflammation at this point is followed by a varying degree of fibrous tissue formation, thickening of the appendix wall and narrowing of its lumen; the peritoneal exudate, if slight, may disappear, or it may organize with adhesion of the appendix to some contiguous structure. The third stage of acute appendicitis is represented by deeper necrosis of the mucosa and submucosa, pus formation, more extensive peritoneal exudate, perforation or gangrene. The second stage inflammations, resulting in some degree of permanent damage and deformity, are those which concern us.

(3) Should the inflammation affect one segment of the appendix more than another, the final healing fibrosis will result in strictures and an irregular lumen. Distal to such strictures or between two of them there will be sacculations in which fecal contents may be trapped until they harden and concretions form; these may then act as ball valves to keep the appendix from emptying properly. Attempts to empty will result in cramplike pains and reflex motor phenomena in the stomach and colon. Furthermore, the trapped contents invite the transformation of intestinal bacteria into pathogenic forms, or permit the development of a few incidental already virulent bacteria into a sufficient number to produce local or metastatic infection. Thus we will have recurring attacks of subacute or acute appendicitis which still further deforms the appendix and a vicious circle is established.

(4) The peritoneal exudate, when organized, may adhere the appendix to some neighboring structure, with varying effects upon the appendix itself or the organ to which it is adherent.

To deny the actuality and importance of chronic appendix disease is to deny that these admitted lesions and abnormalities are serious. What are we to say about an appendix which becomes inflamed, heals, and is left adherent to the right ovary, or turned up and adherent to the gall-bladder, or left with a constriction in the middle and fecal concretions in the distal half, or sharply kinked so that it cannot empty its contents? We believe that chronic appendix disease or, if the term is preferred, "recurrent subacute appendicitis", is the most frequent form of pathology producing what the patient will call "stomach trouble." In a recent report²⁰ of one thousand consecutive examinations of the gastro-intestinal tract in patients presenting symptoms of abdominal disease, 323, or 32 per cent, showed appendices demonstrably pathological in the x-ray examination. In 212 of these patients, the appendix pathology was the only lesion which could be found. In 25 additional cases there were ileocecal adhesions, without the visualization of the appendix, in which the adhesions were doubtless due to healing of the former appendix infection.

The SYMPTOMS which a chronic or subacute appendix disease will produce vary as widely as the pathology.

The pain and discomfort will usually have some relation to the position of the appendix, and the presence of adhesions. The pain may be a burning sensation in either hypochondrium, or in the epigastrium; it may occur after eating or before eating, and may be accompanied by nausea, belching or distention. There may be a complete remission of symptoms for weeks, thereby resembling gall-bladder disease. There may be a reflex hyperchlorhydria, or gastric hemorrhage, as in the cases described by Outland & Clendenning²¹, and seen by us in at least one case. The pain may be localized in the right iliac region, may be diffused, or may occur on the left side; may be constant or periodical, and the patient will usual-

ly describe it as an annoying sense of discomfort. The appetite will usually be capricious, and the general symptoms may be fatigue, headache, failure to gain weight, etc. The urinary symptoms, especially in retrocecal appendices, are important. They resemble urinary tract stone very closely, backache, pain on urination, cramplike pains in abdomen, or even hematuria, as reported by Speed²².

Constipation is very common, due to the disturbed motor functions of the colon, resulting in atony, stasis and colitis. Diarrhea is an occasional result, instead of constipation.

There are usually definite physical signs, but owing to the change in position of the appendix and the pull of adhesions when palpated, the tenderness may be in very unusual locations. Palpation of the appendix region may cause epigastric distress from pylorospasm.

Whenever a radiologic examination is possible, this should be utilized, because it is the most positive method of determining the pathological conditions present and arriving at a diagnosis. In the x-ray examination, what is the evidence of appendix disease? Bearing in mind the evolution of disease changes in the appendix, when this is chronically or intermittently infected, it is necessary to demonstrate gross pathology either under the fluoroscopic or on radiographs. In all the 300 cases cited, there was such gross and visible pathology.

TECHNIC: The stomach, with a barium meal, is always inspected to determine the presence of reflex motor phenomena; then at the end of six hours, the ileo-cecal region is examined on fluoroscopic table for tenderness, mobility and filling defects. Usually at the end of twenty-four hours, sometimes at twelve or eighteen hours, the same region is again examined. If the appendix is visualized, it is inspected under direct palpation for its position, for adhesions, for filling defects, and for tenderness. (Normal Fig. 1-2).

(Figs. 3-7) **POSITION:** The appendix may be congenitally retrocecal or otherwise abnormally placed, and when so located is more likely to give trouble. The appendix may be held in abnormal positions from past disease. The position of the appendix, while not, in itself, of great importance as indicating disease, should be a matter of concern to the surgeon, and should be determined by x-ray before any interval operation.

ADHESIONS: Since one of the earliest effects of an acute infection of the appendix (Fig. 8) is a peritoneal exudate, the most frequent sequellae of unoperated cases are adhesions between appendix and some contiguous structure. Thus we may find the appendix adherent to the gall-bladder, to the right ovary, to the posterior abdominal wall, to the cecum, to the ileum, to the pelvic floor, etc. The appendix may be deformed and kinked by these adhesions. (Figs. 9-17.)

FILLING DEFECTS: It is safe to assume that for every case of acute appendicitis which goes promptly to operation and relief, there are ten which run their course and subside, without operation. These ten, however, may vary in extent and severity from a fleeting infection of the mucosa or submucosa which subsides without marked symptoms, and *usually without pain*, to a frank acute appendicitis, which, for some reason, is not operated. Every attack, whether mild or severe, will leave changes in the appendix. If the infection is localized, such as occurs immediately surrounding a temporary fecalith, there will be local destruction of the mucosa, with sequellae varying from slight fibrous tissue formation and constriction at this point, to perforation. (Fig. 18.) If the infection extends throughout the appendix and the entire mucosa is destroyed, the final result will be an obliteration of the lumen. There may be a number of strictures in the appendix from past acute attacks. There may be permanent collections of hard feces in the tip of appendix or in intermediate sacculations. Both

constrictions and fecaliths, as well as ulcerations, will show filling defects in the appendix shadow. All three of these abnormalities can be readily distinguished by the x-ray examination, and constitute definite and positive proof of past disease, although they may not always indicate active infection at the time. (Figs. 19-28.)

TENDERNESS: The surgeon considers the finding of appendiceal tenderness significant. It is vastly more significant when found by the radiologist, because it can be determined just what manipulation of the appendix produces the tenderness, whether it is the pull of an adhesion, whether it is direct pressure upon the appendix, or whether the tenderness is associated with contiguous organs, such as the pelvic organs in women. Whatever the other findings may be, tenderness should always be elicited before a diagnosis of active appendix disease is made.

The tuberculous appendix may sometimes be detected by its radiographic appearance when filled with barium. (Figs. 30-32.) The characteristics are the irregular, serrated filling defects, usually a short, blunt shadow, lack of mobility and the tenderness to palpation. The appendix may be tuberculous, and the cecum not yet involved, but the reverse is more likely to be true.

The finding of a demonstrably diseased appendix should not, by any means, deter one from completing the examination of the gastro-intestinal tract. So frequently is appendix disease associated with gall-bladder involvement that there is high authority for the statement that gall bladder-appendix infection is a disease entity and always co-exist. Whether this is true or not, it is certain that they are frequently present at the same time. Furthermore, there is a frequent association between appendix disease and ulcer of the stomach or duodenum.

After it has been definitely determined, in a given patient, that definite pathology exists in the appendix, this does not, by any means, in-

dicating that the patient should be taken to the hospital and operated upon. The clinician or surgeon still has several very important things to decide.

(1) Remembering that the gross changes which the radiologist will demonstrate are, usually, sequelae of past infections, there still remains to be settled the question whether the symptoms now troubling the patient are due to active present disease, to recurrent attacks of infection, to reflex motor or functional disturbances from structural changes in the appendix, or to something else besides the appendix condition. Here comes in the necessity for completing the examination, and not taking too much for granted.

(2) If the further examination reveals associated lesions in the gastro-intestinal tract, it must be decided what relation they bear to the symptoms troubling the patient and whether they are remediable, along with the appendix, by the proposed surgery. Or, on the other hand, whether their relation to the appendix disease is so close that they will recover, when the appendix, as the chief offender, is removed.

(3) If the appendix disease is associated with conditions outside the gastro-intestinal tract which will continue to give symptoms, the operation is likely to be disappointing to the patient, and this possibility should be determined, if possible, before any surgery is attempted.

(4) A long-standing appendix disease will usually be accompanied by well-established structural and functional changes, such as atony of the colon, ptosis of the cecum, neuroses of the stomach, and the possible persistence of these must be considered; the symptoms which the patient will complain of most are usually due to

these secondary effects, and failure to relieve them will spell a failure of the operation in the mind of the patient.

(5) A long period of post-operative regimen and medical treatment is usually required, and if both surgeon and patient are not prepared to carry out this regimen, surgery had usually better not be attempted in chronic appendix disease.

In other words, the solution of the problem of chronic appendix disease depends on an accurate and comprehensive diagnosis of the whole pathology present, followed by careful and painstaking surgical and medical treatment, which usually must be carried into months and years after the patient leaves the hospital.

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DEVELOPMENT, RE-ESTABLISHMENT, AND MAINTENANCE OF BREAST MILK*

EARL MENDUM TARR, M. D., *Phoenix, Arizona*

Human milk is the only ideal food for an infant. This is one fact which needs no comment. It is universally accepted.

Acknowledging this fact and knowing that less than one-third of all infants born are receiving human milk at the end of their sixth month simply means that for some reason, good or bad, they are being cheated. Many factors can and must be considered in solving this problem, but the two paramount things for us to keep before us are: (1) Developing the breast milk in every instance; (2) keeping it up to meet the needs of the individual infant.

To develop the milk of the cow you feed her good food at regular intervals, see that she is comfortably housed or pastured and then milk her dry at each milking. This is exactly what must be done to develop good milk and plenty of it in the human. To keep the cow from "drying up" you continue to feed her a well-balanced ration, you milk her regularly and strip her DRY at each milking. And this is precisely what should be done to keep up a normal and adequate flow of satisfactory breast milk.

For the past five years I have endeavored to discover just why some breasts behave so much better than others. Of ten healthy mothers, two will have an abundance of milk up to the sixth or eighth month; five will have plenty for three or four months and the other three will begin to dry up in six or eight weeks. Careful and repeated observation of the mothers and of the infants, while at the breast, eventually gave me a clue which has helped solve this particular question.

No two breasts are alike and so much may be said of infants. The ducts and ampullae of one breast are unlike those of its mate and the

"sucking pad" in one cheek of the infant is scarcely, if ever, the same size of its mate in the other cheek.

My observations have led me to believe that:

1. Infants nurse until they are tired. Then they go to sleep.

2. The amount of milk extracted from a breast by the infant depends upon the size and shape of the ampulla and milk ducts and the development of the sucking pads in the infant.

3. I have found NO INFANT whose sucking pads at birth, or up to the fourth month, were sufficiently developed to completely empty the breast of the mother. The infant becomes tired and goes to sleep long before the breast has been emptied.

With these data before me I have attempted to develop, re-establish and maintain the supply of breast milk by applying rational stimulation to the breast at regular intervals. Mothers are instructed to nurse the infant at one breast for a definite length of time (by the clock), place him back in his crib and then STRIP THE BREAST UNTIL NO MORE MILK CAN BE OBTAINED. This may require ten minutes or thirty.

This added stimulation has, in every instance, resulted in a remarkable increase in the amount of milk and a conscientious mother can keep her breast milk coming almost indefinitely.

TECHNIC OF STRIPPING

Several lengthy articles have been written in which various technics have been described. In 1918 I advised five steps in the technic. Sedgwick, Moore, and Reiss give three movements, or more, and explain them in detail. In a very few simple words the method used by most pediatricists, may be described as follows: Support the breast with the second, ring and little fingers. Place the index finger just back of the

*Read before the annual meeting of the Arizona State Medical Association at Prescott, Arizona, June 14-16, 1922.

areola, below, and the thumb at the upper margin of the areola on top of the breast. Now make a milking (stripping) motion downward and outward to the end of the nipple. This is practically what is now said to be the proper manner in which the breast is to be stripped. Massage of the gland itself should NOT be practiced. Most all women are able after a little practice to satisfactorily empty the breast without causing any pain. If the process of stripping is painful, the technic is faulty.

For convenience of presenting the facts in the cases to be discussed, I have divided them into three groups as follows:

GROUP 1. Mothers who begin to have insufficient milk as early as the fourth to the sixth week.

GROUP 2. Mothers who have, as early as the eighth week, lost their milk.

GROUP 3. Mothers who, at the third or fourth month, find that their milk is rapidly diminishing.

In Group 1, the story is usually the same. A healthy woman has had one or more children and was unable to supply any of them with breast milk for more than three or four weeks. Her present difficulty is that her milk is leaving, the infant has lost weight, cries much of the time and had few and scanty stools. The accompanying history is typical of this group.

Mrs. A. H. T., Albuquerque, New Mexico. Family history and personal history negative. Para 3, one child died at age of 5 months of bowel trouble; second child died when 8½ months old of meningitis. The present infant was born at term after an uneventful and easy labor and weighed 7 pounds 4 ounces. The mother stated that the lying-in period covered ten days and that on the twenty-first day post-partum she had resumed her usual household duties. The infant was being nursed both breasts about every three hours, and when first seen weighed 6 pounds 14 ounces, six ounces less than at birth, and he was then 39 days old. He was brought to me because he cried almost constantly, was not gaining, had very small, hard stools, and seemed really ill. The mother had been indoors practically every day since the babe was born, had taken no recreation, was nervous most of the time and became hysterical upon the slightest provocation.

Examination was perfectly negative except for evidence of starvation. The breasts of the mother were found to be flabby and small, but the nipples were well developed. At 11 a. m. the infant was put to the left breast. He nursed eagerly for 15 minutes and went to sleep. It was found that he got only .6 of an ounce of milk. At 2 p. m. he was put to the right breast. Again he worked eagerly for 15 minutes and then cried for 10 minutes before going to sleep. It was found that at this nursing he got .8 of an ounce. A careful record was kept by the nurse and in the following 24 hours he nursed 7 times and got a total of 3¼ ounces of milk.

On the following day the case was turned over to my special nurse and the usual breast stripping begun. The patience of the mother and the wise and kindly efforts of the nurse resulted in a satisfactory gain as is shown by Chart I.

CHART I. DEVELOPMENT OF BREAST MILK.

Date 1920	Age Days	Weight Pounds	Milk Secretion in ozs.								Totals ozs.
			Hours	6	9	12	3	6	10	2	
February 16	40	6 14/16	By child	.....1	8	6	4	6	1	1—5	2/5
			By hand	.....4	4	8	8	4	4	1—4	1/5
			Total in 24 hours, 9 3/5 ozs.								
			By child	.....3	2	2	3	2	2	4—18	
March 18	70	11 4/16	By hand	.....4	3	3	2	1	2	3—18	
			Total in 24 hours, 36 ozs.								

In Group 2 the greatest problem is met. Most of these women, who lose their milk as early as the eighth week, are overworked, undernourished, and are physically and mentally unable to be more than AVERAGE mothers un-

less careful and well balanced consideration is given them. As a class they are too poor to employ an attendant who charges anything like what it is worth to see them through their lying-in period. Practically none of them

are able to have help in the home after the baby is born but depend upon a neighbor "running in" now and then to help what she can. To suggest a nurse is out of the question; to prescribe drugs, which are expensive and which practically NEVER have the least effect upon the milk production, is also unwise. The following set of directions is given to these women and they are instructed to call up daily and report to the office nurse their difficulties.

Take no medicine except a cathartic as needed.

Drink two quarts of water and two quarts of milk daily.

Eat any and all foods which agree with you.

Spend at least one hour daily out of doors.

Nurse the infant at ONE breast at the hours marked on your correction sheet and at NO OTHER TIME. STRIP THE BREAST AFTER EACH NURSING UNTIL DRY.

Lie down while nursing the baby. In this manner you will get more rest each day.

Take some form of recreation daily.

Follow these directions and you will have sufficient milk for your baby.

DO NOT WORRY. When in doubt, phone the nurse.

CASE HISTORY—RE-ESTABLISHMENT

Mrs. R. W. R. Para I, family and personal history negative. Pregnancy uneventful and was delivered at a local hospital of a male infant weighing 6½ pounds. Her attendant was very watchful of the case and, because the infant weighed less than the usually considered normal weight, the infant was put to the breast every two hours. On the ninth day the mother and babe returned to their home and on the sixteenth day the mother resumed her household duties. The infant cried after each feeding, but was forced to the breast every two hours, upon the advice of the attending physician.

For six weeks he was unhappy, gained and lost and continued to vomit, and when seven weeks old was brought to me for advice. Breast stripping, proper feeding schedule and advice to the mother resulted in a satisfactory improvement as shown by Chart 2.

CHART 2—RE-ESTABLISHMENT OF BREAST MILK.

Date	Age	Weight	Milk Secreted								Totals
1921	Weeks	Pounds	in ozs.								Ounces
April 8 to April 16	7-8	6 9/16	Hours	6	9	12	3	6	10	2	
			By child	0	.7	1	1	2	2	4	10.7
			By hand	1	.5	2	.9	1	2	3	10.4
			Total in 24 hours, 21 1/10 ozs.								
May 22 to June 1	13-14	12 5/16	By								
			child	.3	3 1/2	3	2 3/4	3	4	4	23 4/16
			By								
			hand	1	1 1/4	1	.9	2	2	1 1/4	9 1/2
			Total in 24 hours, 32 3/4 ozs.								

In Group 3, we have mothers of practically every type. It has been my experience that the majority of women in this class are those who are active in public and social affairs. Many of them believe that if they have been able to supply breast milk for three months that from that time on the infant will thrive on most anything. They frequently say, when questioned, that they had no idea that it was natural for breasts to function profusely for a longer period than three or four months. It has also been my experience that many of these women are keenly disappointed when a formula is refused

them and they are instructed to continue nursing regularly and strip the breasts after each nursing. Frequently they tell me that they feel that they have "done their duty" by the infant when they stick to the routine of breast feeding for four months.

The wealthy mothers of this group are treated very curtly. It is pointed out to them that the only fair thing to do is to continue nursing and try to develop more milk. Those who will do this are given every possible support and aid; the others are instructed to go elsewhere for service.

The middle class mother of this

group is easy to handle. She has had experience with bottle feedings, usually, and actually knows that it is much easier and more satisfactory to feed from the breast. Often she hints that there is less likelihood of her becoming pregnant while nursing her infant. While this is certainly nothing more than a myth, I allow her what little satisfaction she gains from it and pass her along by agreeing with her. All that she really needs is to be taught how to strip her breasts and with proper encouragement she goes on nursing for five or six months longer without any difficulty.

The very poor mothers of this group are frequently less intelligent than one would expect. Their faculty of reasoning has been poorly developed and they rarely ever grasp the facts in favor of breast feeding over bottle feeding. If allowed, they would argue for hours in favor of some of the so-called baby foods which are marketed in tin cans and pasteboard boxes. While not hopeless, their case requires considerable patience, frequent visits by the nurse or myself, and eventually a few of them learn to follow blindly the directions given them without actually believing in what they have been taught to do. We feel, however, that this type is especially worth working with. About a year ago questionnaires were sent to many of the doctors throughout the state with the hope that valuable data might be compiled. Very few answers have been returned but most of the replies have been to the effect that *breast fed infants unquestionably withstand infection and the hot weather better than do bottle fed babies*. This expression certainly is encouraging because once we make it clearly known that 100 per cent of women can nurse their babies there will be absolutely no excuse for the use of the now over-worked "patented foods".

To test the works out in Phoenix, I enlisted the co-operation of Dr. Charles B. Palmer. From January 1, 1921, to July 30, 1921, all infants delivered by him were the offsprings of mothers who were physically able to furnish abundant breast milk. The mothers

were encouraged to nurse regularly and to strip the breast after each nursing. Fifty-two of these cases were followed for a period of six months. At the end of that time 97.6 per cent of these infants were still being fed from the breast **EXCLUSIVELY**. One case is especially interesting and briefly is reported as follows:

Para 5, healthy, but had lost all previous children at birth. He came under the care of Dr. Palmer at the eighth month and a Caesarian seemed indicated. She was so delivered of a female infant weighing 5 pounds 14 ounces. The mother made an uneventful recovery and the breasts were stripped regularly after each nursing for four months, at which time the infant weighed 11 pounds 6 ounces and was able to practically empty the breast. I did not see the case again until the day before the child was one year old. On that date she weighed 19 pounds 4 ounces, being almost two pounds above weight for her age and sitting height.

What is true of a healthy mother in Minneapolis has been found equally true of the same type of woman in Phoenix. Because of the fact that in Arizona, Phoenix especially, we have very inadequate means of properly handling real sick children and also because it is quite generally believed that the very hot weather makes the production and delivery of milk which is perfectly safe for infants, almost impossible, we should all, without exception, gladly encourage more mothers to nurse their babies during the greater part of the first year.

Impressions gathered would almost lead one to presume that:

1. Doctors and nurses teach maternal nursing, but not so thoroughly as they should.

2. Mothers of all classes are eager for advice regarding the feeding of their babies. Are we all conscientious enough regarding the advice we give?

3. Stripping the breast will help every instance. Proper food, exercise, recreation and general right living should be encouraged as well.

4. There is no such thing as the milk of the mother being "poison" to her infant. It is far the best food to be had.

5. Knowing these facts, there is no excuse for the extravagant use of artificial foods.

BACTERIAL GROWTH IN THE GASTRO INTESTINAL TRACT:
BIOLOGICAL NOTES*ELLIOTT C. PRENTISS, M. S., M. D., *El Paso, Texas.*

In our contact with digestive diseases we are quickly impressed with the fact that bacterial infection plays a very important role. A study of bacterial growth in the gastro-intestinal tract should aid us in our grasp of both diagnosis and treatment, as it involves fundamental conditions. In nearly all cases of chronic digestive diseases, sooner or later, bacterial infection is one of the factors to be considered. It may not be directly related to the primary cause, but the results are such as to render secondary bacterial invasion almost certain. This can be readily understood when we remember that bacteria are constantly present on the mucous membrane of the whole digestive apparatus, and that practically all of these bacteria are capable, under conditions favorable to them, of producing or aggravating pathological conditions, but usually do not do so on account of the fact that normal tissue resistance prevents it.

The bacteria present are implanted in various ways, and remain because conditions are favorable to their growth; their existence represents the sum total of their ability to grow and the existing physical conditions in the gastro-intestinal tract.

For our purposes we might subdivide the bacteria found into four groups: 1. Those capable of producing specific diseases, as typhoid fever, cholera, dysentery, etc. 2. Those capable of producing severe infections, but not a definite specific disease, and not usually doing so, even when present, such as the pus cocci, streptococci, pneumonococcus, etc. 3. The predominating normal flora, which may under special conditions produce or aggravate lesions, such as the colon bacillus. 4. Those which are not normal inhabitants and are not known under any ordinary con-

ditions to cause pathology. This is probably the largest group, and constitutes all the other bacteria ingested.

The above is intimately related to the subject of parasitism and infection, and the definition of these terms should be of interest. Theobald Smith (1) states that "In pathology it has been customary to distinguish between parasitic invasion and bacterial infection, the former producing relatively slight disturbances in the host, the latter the acute, often highly fatal, epidemic and epizootic diseases. The distinction is useful, but it can be made to apply only to extremes. Gradations of all shades occur. For the sake of more exact terminology, the distinction between invasion and infection might be made to hinge upon the capacity of the parasites to multiply in the host. It is thus best to class all living invasive organisms as parasites, subject more or less to the same host mechanism of repression and destruction. At one end of the scale are the highly specialized forms, adapted to one host species or even one race. At the other end are types merging from the predatory or saprophytic stage and acquiring parasitic habits."

The question of whether bacteria can grow in the digestive tract without causing some injury is interesting. I doubt if it is ever done. The injury may be very slight and remote, but it is probably there.

Metchnikoff states that the aging process is hurried by absorption of bacterial toxins or products of bacterial action on food from the intestines, even those produced by the normal flora, and intimating that this occurs even when motility is normal, and no pathological condition present. I believe that he is correct in this, and it fits in very well with what we know about life in general.

*Read before the *El Paso County Medical Society*, April 6, 1922.

In culture media bacteria at first grow very rapidly, then growth slows down and finally ceases, but the bacteria live for a variable period, and finally die. When charted this constitutes a definite life curve. The principal cause of this slowing down and final death is the toxins that have been thrown into the medium by the bacteria, and which are injurious to them. These toxins are not removed from the medium. A living organism cannot live indefinitely in its own excretions, no matter how favorable the other conditions may be. Neither can the human being do it. The removal of the poisons from the life medium is necessary, and failure to remove them, or the inability of the organism to destroy them, is injurious in proportion to their character and amount.

The constant absorption of bacterial toxins from the intestinal tract is bound to have its effect, however mild and remote. The production of liver cirrhosis, arteriosclerosis, and certain cases of severe anemia clearly indicate this. Bacterial toxemia of whatever origin may be taken as an example.

There are a number of factors that directly influence bacterial growth in the digestive tract. The temperature and moisture may be considered ideal. The maximum growth may occur at points a little above or below those present in the intestines, but the margin is only slight.

The various bacteria found have different cultural characteristics; that is, they prefer to grow upon certain substances under special conditions. The flora existing in any part of the digestive tract at a certain time are there because they find conditions favorable which other bacteria cannot survive. They are different in different parts of the digestive tract, as is shown by killing an animal and making cultures of the contents of the digestive tube in various segments from the stomach to the anus.

The small variety of bacteria found in the feces is due not only to factors

unfavorable to their growth, but to the fact that those that grow best crowd out the others; a directly antagonistic effect against them. This no doubt varies from the more easy utilization of available food to direct biological antagonism.

The growing of bacteria on culture media is necessary for their isolation, identification and study, but in the digestive tract the medium is composite, as a mixture of foods is ingested. Owing to the preference of various bacteria for special media the character of the flora can, within certain limits, be changed at will. It is only necessary to mention here the vegetable and meat diet, the implantation of the lactic acid bacilli with buttermilk, and recent work with the bacillus acidophilus, especially in combination with lactose and dextrin. The contrast between the flora of intestinal putrefaction and fermentation is marked.

Gastro-intestinal motility is of great importance. While the number of bacteria is not directly proportional to the time of retention of food, the longer the delay the more time there is for the local irritation of the intestines, and the absorption of toxins.

There does not seem any good physiological reason why food should be retained in the colon as long as it is. Metchnikoff's work on this point is convincing. If we had only an eight-hour retention in the colon we would no doubt be better off, work harder and live longer.

When there is stasis it is practically always in the colon. X-ray examination demonstrates that there is seldom any barium in the ileum 24 hours after ingestion, no matter how marked the colonic stasis is.

The chemical reaction has an important influence upon the character and number of bacteria. The hydrochloric acid in the stomach no doubt exerts a strong inhibitory effect on the growth of the ordinary bacteria, especially those prevalent in the intestines, otherwise the colon bacillus would be a constant and thriving inhabitant of the stomach. Hydro-

chloric acid is not, however, the powerful antiseptic that many think it is. A recent article by Nicholas Kopeloff (2) shows that the number of bacteria in the stomach is largely dependent upon the amount of saliva swallowed and its bacterial content. We also have to bear in mind that there are many instances in which hydrochloric acid is subnormal in the stomach contents, or absent from it.

The period of retention of food in the stomach is long enough for the establishment of a characteristic and abundant flora, but this does not exist, owing to several factors, hydrochloric acid, and especially the gastric motility and the immunity of the gastric mucosa. But here we must remember that the colon bacillus does not thrive in the stomach even in the absence of hydrochloric acid.

The reaction in the small intestine is alkaline, unless changed by fermentation, in which case the acidity is the result of bacterial or yeast growth. Any change from the alkaline reaction, either in the small or large intestine, is due to such growth, or a too starchy or carbohydrate diet.

The secretions exert some effect on bacterial growth, but mostly indirectly. The hydrochloric acid of the stomach has just been mentioned. There does not seem to be any particular antiseptic property in pepsin, bile, pancreatic or intestinal juices, and if they aid bacterial growth other than by their reaction it is not known.

It is another matter, however, with the products of the action of these secretions on the food. Bacteria grow better, as a rule, on peptone and other products of proteid digestion than they do on meat, and the same is true of the sugar and other products of starch digestion in their relation to starch. Peptone and sugar resulting from ferment action are both found in the test-meals. The same is probably true of the products of fat digestion.

The gases found in the gastro-intestinal tube are probably of more importance than ordinarily believed.

The gaseous medium in which all animals live is considered of vital importance, and the same applies to plant life. Bacteria, however, seem to have more leeway, especially with regard to oxygen. The nitrogen in the air swallowed with food, as far as we know, seems to be inert.

The gaseous products of bacterial growth, as mentioned above, unless removed, should tend to inhibit the further growth of the bacteria producing them. Its removal is accomplished by absorption of the gas and its expulsion by peristalsis. Here also we must consider the influence of such gases on the further growth of the other bacteria that did not produce them. This would, if other factors remained the same, usually be inhibitory.

The following gases may be mentioned as being present under varying conditions: Hydrogen, oxygen, nitrogen, marsh gas, carbon dioxide, sulphuretted hydrogen, and mercaptan.

What is the influence of these gases on the epithelium? With normal digestion there is probably none, but when gases are present in considerable amounts there would be more or less distention, with pressure, and there would be a larger proportion of gases known to be irritating, such as hydrogen sulphide. This could readily still further stimulate bacterial growth by lowering the natural epithelial resistance due to local irritation.

In studying the bacteria of the gastro-intestinal tract we implant the material on special media and reimplant, and thus isolate them and study details. We must remember that neither the media nor the conditions are the same as found in the intestinal tract. It would be interesting to conduct a series of experiments simulating intestinal conditions, except for the presence of intestinal tissue, using the various factors singly and in combination. The use of various articles of ordinary diet, singly and in mixture, varying the reaction, and with and without acid, pepsin,

bile, pancreatic juice and ferments, and the intestinal juices, and implanting the contents of the stomach and intestines as well as the isolated bacteria. With proper care the various gases found in the intestinal tract could be placed in the test-tubes, as well as mixtures of them. In ordinary work air is the gas medium used, but this does not represent the condition in the intestinal tract.

The large number of bacteria in the feces attest very strongly the favorable conditions for their growth in the intestinal tract. In normal feces they constitute about 25 to 30 per cent of the dried material. They must multiply with enormous rapidity to attain such numbers, as the average retention of food in the gastrointestinal tract is only 36 hours. A point of interest here is the fact that most of the bacteria are dead when passed; only about 1 to 5 per cent are living, suggesting that there are powerful antiseptic factors at work constantly in the intestinal tract. This constitutes an apparent anomaly. On the one hand conditions encouraging extremely rapid bacterial growth, as we might say, in an almost unlimited manner, and on the other hand, and at the same place, an almost equally rapid killing of the bacteria.

In many instances of severe pathology in the intestinal tract I have had cultures made from the feces, but in practically none has it been of any assistance in either diagnosis or treatment, the report usually being a pure culture of the colon bacillus. Sometimes cocci grew, but very seldom the streptococcus. This was in spite of the fact that the stools were swarming with bacilli of varying sizes and shapes, and also innumerable cocci, some in fair-sized clumps. Infection of adults with the dysentery bacillus in this region must be rare, as some suspicious cases of it were examined and reported negative.

We might say that sooner or later all the bacteria with which we are in contact gain access to our gastrointestinal tract. This applies equally well to our respiratory tract, yet the

flora of the two regions are very different. What is the cause of this difference? We would naturally answer right away, "the food," yet the food element does not exist in the respiratory tract, and if an individual were placed on nothing but a boiled water diet for several days with thorough cleansing of the mouth, all the bacteria could not be washed out with salines, and the dejecta would still contain the characteristic flora. Restoration to food would then give the same findings as before the diet.

It seems evident that the tissues are the determining factor. The primary and necessary place of growth is evidently the intestinal epithelium, with the food playing an important secondary role. I believe that the culture experiments suggested above would demonstrate that. The colon bacillus predominates above all others probably on account of its greater affinity for the intestinal mucosa.

Innumerable other bacteria which gain access to the intestines do not thrive, no doubt, on account of the absence of this affinity.

We might here again refer to the stomach. The colon bacillus does not thrive there because the gastric epithelium must be strongly antagonistic to it. The acid cannot account for it, as it is frequently absent from the stomach contents without the colon bacillus being implanted.

I do not mean by the above that the bacteria do not grow in the food, as most of them found in the feces do multiply in that way, but I do mean that the determining factor in the nature of the flora is the specific influence of the epithelium.

Is there any damage done to the normal intestinal epithelium by the normal flora growing within normal limits? The answer must be "yes", but we do not know to what extent. Bacteria living on epithelium, that is, using it and the fluids exuded as food, must damage it in the process. This damage must be slight, but at present we have no way of estimating it. Toxins are produced by this nor-

mal flora, which, when found in large amounts in excessive bacterial growth, are known to be very injurious; so we may assume that they are also injurious, but to a smaller degree, in much smaller amounts. Under normal conditions, of course, the injury is slight and readily overcome. This local irritation is constantly going on, as is also the absorption of the poisons into the portal circulation. As mentioned in the early part of the paper, these toxins probably exert an inhibitory effect on the excessive overgrowth of bacteria in the intestinal tract.

The constant swallowing of bacteria from areas of focal infection frequently has an important influence on the bacterial content of the intestines. Instances of this are pyorrhea, chronic tonsillitis, gastric and duodenal ulcer, gall-bladder and liver in-

fections, and local pathology in the intestinal mucosa. This can, and frequently does, initiate local infections, perhaps more than we know at present, and is always a source of danger when there is some primary area of pathology in the digestive tract. It has always seemed remarkable to me that the constant swallowing of tuberculous sputum, especially in the late cases, causes as little digestive trouble as it does.

In closing, I might say that this field is so large that a single paper can hardly do more than touch upon some of the interesting points, but can open the subject to a profitable discussion.

REFERENCES

- (1) Science, New Series, Vol. LIV, No. 138; Aug. 5, 1921; p. 102.
- (2) Nicholas Kopeloff, Jour. A. M. A., Feb. 11, 1922; Vol. 78, No. 6.

IMPORTANT ANNOUNCEMENT

Of more than usual interest to the medical profession is the announcement that the Abbott Laboratories, of Chicago, have purchased the Dermatological Research Laboratory, of Philadelphia.

The Abbott Laboratories is one of the leading manufacturers of "Council Passed" medicinals, and this addition to their products will give them added and well-deserved recognition from the medical profession everywhere.

It will be remembered that the Dermatological Research Laboratory was the first in the United States to produce arsphenamine during the war, when there was such a scarcity of this article, and this laboratory became well known to the profession for their patriotic attitude in developing and manufacturing medicinal preparations in this country. By the purchase of the "D R I" products,

the Abbott Laboratories inherit their prestige.

The Dermatologic Research Institute, which became the property of the Abbott Laboratories on November 1st, will continue to operate in Philadelphia under the direction of Dr. George W. Raiziss, head of the Department of Chemistry, and his corps of specially trained assistants, who have been connected with the institute from its beginning. Orders for the "D R I" products will be promptly filled from the Philadelphia laboratory, from the home office of the Abbott Laboratories, Chicago, or from any of their branches or distributors.

For further information regarding their purchase of the Dermatologic Research Laboratory, the readers of this journal are referred to the statement of the Abbott Laboratories, on another page of this issue, entitled "Important Announcement to the Medical Profession."

EL PASO COUNTY MEDICAL SOCIETY

The El Paso County Medical Society met November 6 with 41 members and 5 visitors present.

Dr. R. B. Homan reported a case of a man, age 36, who swallowed a dental crown on June 17, 1922. Shortly afterward he became very ill with symptoms which led to a diagnosis of typhoid, but on development of cough and hoarseness, an x-ray was taken of the chest which showed the crown lodged in the right bronchus. This was successfully removed on July 20, but the cough did not let up entirely. The patient, who was at that time living in New York, went on an automobile tour and while in Buffalo had a large pulmonary hemorrhage on July 28. He immediately came to the southwest, and while on the way had to be taken from the train at Houston because of another large hemorrhage, but subsequently came to El Paso. At the present time he has a slight cough with no expectoration except that which comes from the nose and throat. Repeated examination of this material has been negative for tubercle bacilli. He has a slight elevation of temperature on exercising and since being here has had many small hemorrhages, but no large ones. Physical signs in the chest are practically nil. Dr. Homan thinks the patient is not tuberculous, but that the bleeding comes from an ulcer at the site of lodgement of the crown and he proposes to compress the right lung as treatment.

Dr. H. H. Stark reported and demonstrated a patient, a workman in one of the local railroad shops, who was struck some time ago in the right eye by a piece of steel. The body entered the eyeball, the wound of entrance being about five mm. up and out from the cornea. From the situation of the body on an x-ray plate it was thought that it had passed through the eye. It was localized with a Sweet localizer and found to be 6 mm. behind the orbit in the orbital fat. Both the wounds of entrance and exit have now healed and the scars could be easily seen with the ophthalmoscope, and there has been no interference with vision, it being entirely normal in the eye.

Dr. H. S. White reported a case of a man, age 56, who for the past ten years has been from pillar to post, visiting doctors, osteopaths, scientists, etc., for bladder trouble. He has been an invalid for some years and leading a catheter life. An x-ray, none having been previously made, showed three stones in the bladder, about one-half inch, one inch and two inches in diameter, respectively. The small stone was buried in the bladder neck and acted as an obstruction. Upon operation a small, contracted bladder was found which resembled a chicken gizzard in appearance. The stones were removed and the patient is rapidly recovering and is now able to retain a pint of urine, this being six months after operation.

Dr. H. S. White reported another case of a boy, age 17, an epileptic for three years, who gave a history of a hard instrumental birth, but no other history of trauma. The attacks at first were at intervals of from one to two weeks, but have gradually grown more frequent until during the past year they have come as often as three times a day. This boy had also received treatment from a large number of sources without relief. An x-ray of the skull showed a calcified area about one inch in diameter in the right parietal region about one-half inch below the surface. At operation enlarged veins were found radiating from the calcified area out over the surface of the brain. The area was easily found and, on opening, was found to be a small cavity lined with calcium salts. This was thoroughly cleaned out and the wound closed without drainage. For a month after the operation the patient continued to have "poundings in the head" similar to what he had experienced before the operation, but had no epileptic attacks. The so-called pounding gradually disappeared and now, four months after operation, there have been no further attacks and the patient seems entirely well.

Dr. G. Werley demonstrated two small tubes of equal size and caliber, one containing 16 drops of Tr. Digitalis and the other containing 16 minims of the same tincture. The 16-minum tube seemed to contain about twice as much of the liquid. Dr. Werley gave this demonstration to show that the method of measuring by drops is very inaccurate and that when a patient is supplied with a bottle of Tr. Digitalis and told to take a certain number of drops, presumably an equal number of minims, he will not get the required dose of the drug, and consequently the desired action will not be obtained.

Drs. H. Crouse and W. S. Larrabee demonstrated four interesting x-ray plates. The first was that of a calcified pituitary gland in a woman, age 40, the mother of three children, who had been melancholic practically all her life and who a few years ago was confined to an insane hospital. On being told the nature of her trouble and having been shown on the plate the site of her trouble she apparently tried to shoot out the calcified area. Autopsy disclosed the pituitary gland as described. Her death prevented Dr. Crouse from trying massive doses of pituitary extract.

The second plate was that of a skull of a girl, age 8, who gave a history of epilepsy, but who was otherwise very bright. The picture showed marked syphilitic changes in the parietal bones and sella turcica.

The third plate was also of a skull of a man, age 23, showing syphilitic changes in the parietal, frontal, occipital bones and the sella turcica.

(Continued on page 446)



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Medical Director

EDWIN D. WARD, M.D.

Assistant Medical Director

CALVIN B. WITTER, M.D.

Röntgenologist

T. C. CROWELL, M.D.

Pathologist



The fourth plate was that of an osteosarcoma of the knee in a man, age 24, which shows a tendency to disappear under x-ray treatment.

Dr. D. E. Smallhorst read a paper, "Foods and Feeding", which was discussed by Drs. Prentiss, Werley, E. A. Duncan, W. R. Smith, R. B. Homan and Major T. E. Scott.

Dr. M. I. Neff read a paper, "Some of My Experiences in Eastern Europe After the War", which was discussed by Drs. J. W. Tappan, H. H. Stark, and H. Crouse.

Dr. H. H. Stark reported all arrangements completed for the forthcoming annual meeting of the Medical and Surgical Association of the Southwest, which will be held at El Paso December 7, 8 and 9.

STAFF MEETING OF ST. JOSEPH'S HOSPITAL, PHOENIX

The regular monthly meeting of the open staff of the Sisters' Hospital, Phoenix, which was held on November 9th, was, by far, the best meeting so far held. Twenty members of the staff were present and engaged in a lively discussion of several cases recently treated in the hospital.

The first case discussed was one of cancer of the pancreas, with metastases to the liver. This was correctly diagnosed clinically and by the x-ray findings, which included pneumoperitoneum. The operation revealed conditions which could not be removed, and palliative cholecystotomy was done, as the common duct was involved in the malignant growth.

The second case was one in which all the findings pointed plainly to cancer of the colon, there being obstruction, cachexia, loss of weight, and x-ray filling defects in colon. Operation failed to reveal the expected pathology. The causes for this error in diagnosis were discussed at some length.

The third case was another error in diagnosis—the symptoms indicating acute appendicitis; following the removal of appendix, the pain continued and finally bowel obstruction forced a second operation, which showed massive adhesions of the small bowel, evidently of long standing, involving the entire small intestine—the entire mass being involved in a volvulus. This was relieved, but the patient developed pneumonia and died two days later.

Two cases, diagnosed acute nephritis, who died soon after entering the hospital, and another similar case just recently entering the hospital, were then discussed, the possibilities of error in diagnosis and the treatment administered being open for general criticism.

Radiograph of a case of dentigerous cyst was shown.

Two cases of Meniere's syndrome, or labyrinthine "stroke" were presented, with histories and the etiology and fine points in diagnosis discussed by the otologists present.

A resolution of condolence for the "poor dubs" who failed to attend the meeting was passed by unanimous vote.



THE NEW HOME OF HYNSON, WESTCOTT & DUNNING OF BALTIMORE

This national drug firm has just erected and occupied its own building at Charles and Chase Streets, Baltimore. The building is artistic in appearance and adapted to accommodate the several departments of their rapidly developing business which began in a small way in 1889, but has grown to a million a year, with an organization of 125 people. Their unique sales department alone comprises 19 men who visit physicians in all parts of the United States, but do not sell goods. Thirty-five of their products have been accepted by the Council, and are advertised in this Journal. None of their preparations are offered direct to the public but are introduced to the medical profession for the use of physicians and their patients. M. H. P. Hynson (one of the founders), died in 1921; but their growing business has now been established in new quarters under the immediate supervision of Messrs. James W. Westcott and H. A. B. Dunning (the latter being the active administrator), with a highly trained force, equipped to meet promptly the demand of the medical profession anywhere and at all times.

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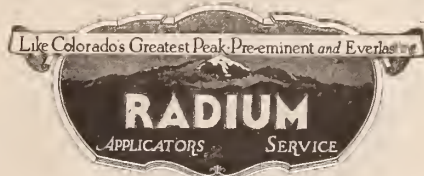
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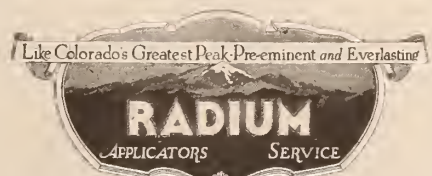
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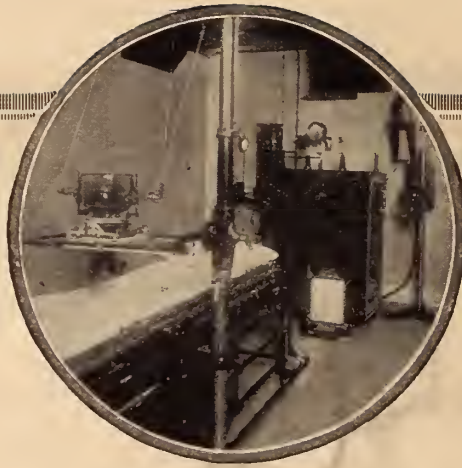
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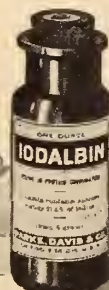
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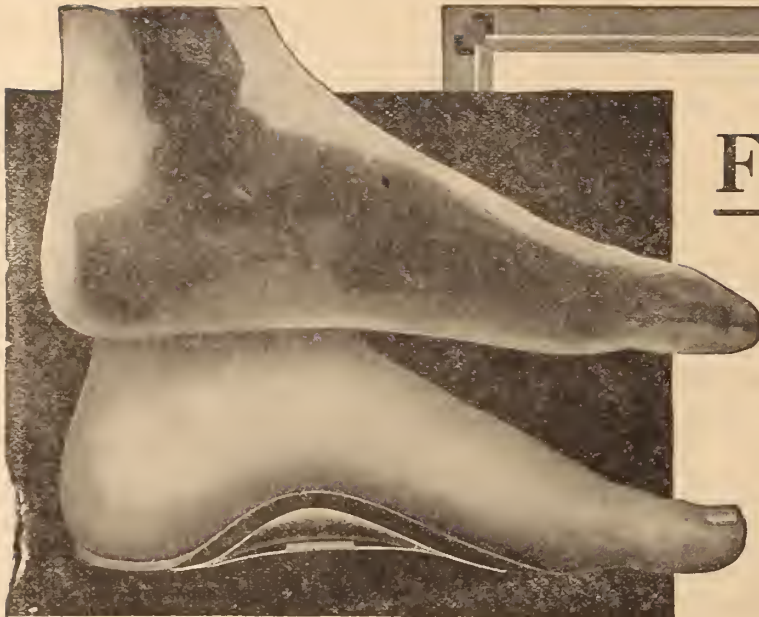
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GASTRON

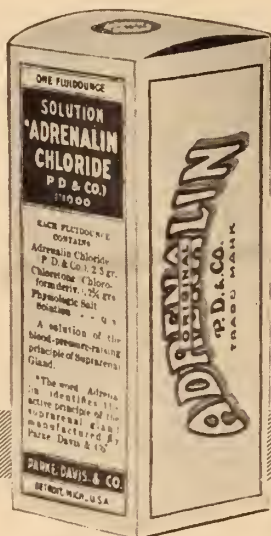
The gastric enzymes, plus

It is known that gastric function does not depend upon enzymes alone; principles, organic and inorganic, co-ferments that stimulate and maintain enzymic action are of essential auxiliary importance.

All the soluble organic and inorganic, activated and activating principles are present in Gastron, the entire extract of the stomach gland tissue. Clinically, against disorders of gastric function, Gastron is exceeding the most sanguine expectations.

*Gastron, an acid-aqueous-glycerin
extract, no alcohol, no sugar*

Fairchild Bros. & Foster
NEW YORK



Just Off the Press:
The 1922 Catalogue.
Gladly Sent to Physicians.

Adrenalin

The Emergency Remedy

TWENTY years ago the chemical formula for Adrenalin was worked out by our research chemists. That discovery alone assured the renaissance of endocrinology—this time as a serious scientific study.

More thought and work and expense have been lavished on determining the exact pharmacology of Adrenalin than on any of the other hormones.

Today Adrenalin is entrenched in the Materia Medica side by side with such indispensable remedies as digitalis and quinine.

Adrenalin is essentially an emergency drug, and its main indications are in the treatment of shock, hemorrhage, and the paroxysm of asthma. It is used advantageously in connection with local anesthetics. Its unflinching action forms the basis for certain diagnostic procedures, such as the Goetsch test and the test for adrenal hypersensitiveness.

Parke, Davis & Company

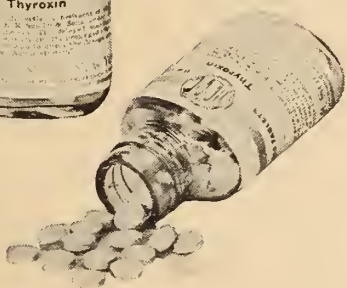


THYROXIN

Prepared only by E. R. SQUIBB & SONS

Under License of the

University of Minnesota



PURE, crystalline Thyroxin is the physiologically active constituent of the thyroid gland; a compound of definite and known chemical compo-

sition containing 65 per cent. of iodine, organically combined, as an integral part of the molecule.

Fifteen grains of desiccated thyroid prepared under favorable conditions contains approximately $1/64$ grain of Thyroxin. This ratio may be used in determining the initial dose of Thyroxin.

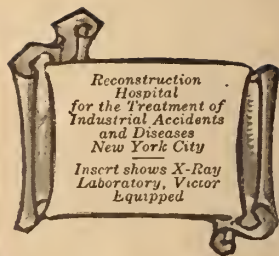
The physiological action of Thyroxin bears a quantitative relation to the production of body energy, and a system that is lacking in such energy may be brought up to normal production by its administration.

Thyroxin is marketed in two forms—Tablets containing the partially purified sodium salt of Thyroxin for oral administration; and the Pure Crystalline Thyroxin for intravenous injection in those cases in which the Thyroxin is not absorbed quantitatively when given by mouth.

Complete Information on Request.

E. R. SQUIBB & SONS, NEW YORK
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858.





WHAT X-RAY OUTFIT SHALL BE INSTALLED?

IN THE last twenty years X-Rays have found an ever-widening application in the practice of medicine. X-Rays are now applied in ways undreamed of ten years ago. The result has been that machines of different types have been developed for different diagnostic and therapeutic purposes.

The most important developments in recent years have been the result of the work done in the Research Laboratories at Schenectady, N. Y., which stand behind the Victor X-Ray Corporation and which conduct never-ending investigations to the end that Victor apparatus will always evolve from something that is the best of its time to something still better.

The ranges of service of X-Ray machines that have been developed to meet the needs of

physicians and surgeons are so varied that the practitioner is often at a loss to know what particular machine it would be advisable to install. To assist him, the Victor X-Ray Corporation maintains Branch Sales and Service Stations in the principal cities. Any physician or surgeon may call upon these Stations for advice and guidance. A technically informed representative will be sent on request—a representative who studies the practitioner's needs and then recommends the type of machine that will meet them best.

It is the duty of Victor Service Stations, when called upon, to give technical advice to users of Victor machines, so that the desired results are obtained. They also keep the apparatus in good order.

VICTOR X-RAY CORPORATION, Jackson Blvd. at Robey St., Chicago

Territorial Sales and Service Stations:

DALLAS, TEXAS: 1809½ MAIN STREET
HOUSTON, TEXAS: 347 KRESS BUILDING
LOS ANGELES: 930 S. HILL STREET



SOUTHWESTERN MEDICINE

Official Organ of the New Mexico Medical Society, Arizona State Medical Association, El Paso County (Texas) Medical Society and the Medical and Surgical Association of the Southwest

For Table of Contents—See Advertising Section Page 1

GASTRON

*Obtained by direct extraction
from the entire stomach mucosa*

Contains the activated principles of gastric cells, the enzymes, the associated organic and inorganic constituents; of standardised proteolytic power.

Indicated in disorders of gastric function, gastric deficiency; a useful accessory, compatible with and contributing to the success of therapeutic measures---by promoting digestion and nutrition.

Alcohol and sugar free.

Fairchild Bros. & Foster
NEW YORK



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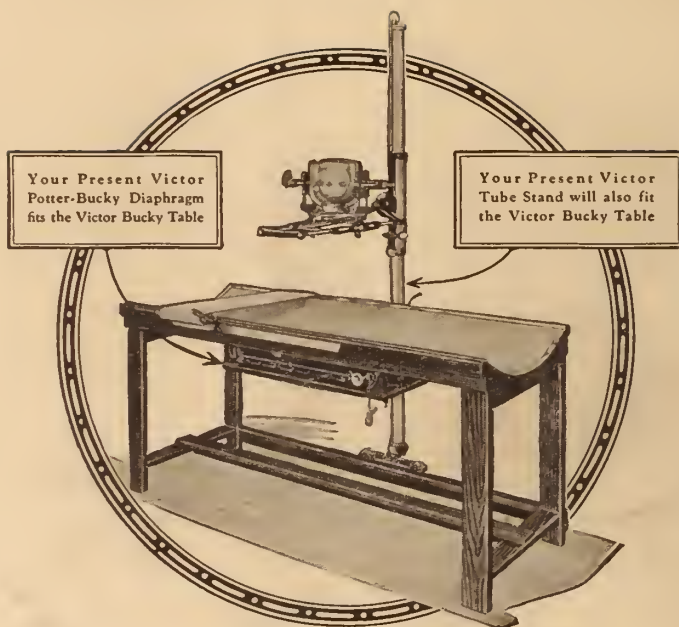
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Parke, Davis & Company



Victor Improvements Will Fit Your Present Victor Apparatus

THE research systematically conducted by the Victor X-Ray Corporation results in the development of many improvements. No physician wishes the science of Roentgenology, so dependent on apparatus, to stand still.

But what of the physician who has bought a complete Victor equipment, only to find, a few months later, that improvements have been made? Must he install an entirely new equipment in order to keep abreast of the times?

It has been the policy of the Victor X-Ray Corporation, wherever possible, to design apparatus and their accessories so that *improvements may be adapted to*

existing apparatus without the necessity of discarding an entire equipment. In a word, Victor apparatus is standardized. Take the Victor Bucky Table, for example. This table will readily accommodate the Victor Model Potter-Bucky Diaphragm; any Victor tube stand can also be attached in a few minutes. Thus, in instances where the X-Ray Laboratory already has the Victor Diaphragm and Tube Stand, the only expense involved is the table itself.

So, standardization of Victor apparatus makes it possible for the physician to take advantage of the latest developments of research without completely discarding his X-Ray equipment.

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Gastron, in view of what it is, and what it accomplishes, constitutes a distinct advance in gastric gland therapy. No alcohol.

Fairchild Bros. & Foster

NEW YORK

6-oz. vials, unlettered, labels readily removed---to facilitate prescription in the original container.

Specialists in the applied chemistry of the digestive enzymes

FOR SALE

Good practice and interest in ten bed hospital. Excellent opportunity for man and wife who can do some nursing. Will require \$2500.00 to handle. Reason for sale, disabled in service and unable to do amount of work required.

Address **MAYER HOSPITAL** Mayer, Ariz.

FOR SALE

Vulcan coil for radiographic work. Weighs fifty pounds and operates on 60-cycle alternating current. Coil and two tubes in good shape.

Address

PATHOLOGICAL LABORATORY

Box 1328

Phoenix, Arizona

FOR SALE

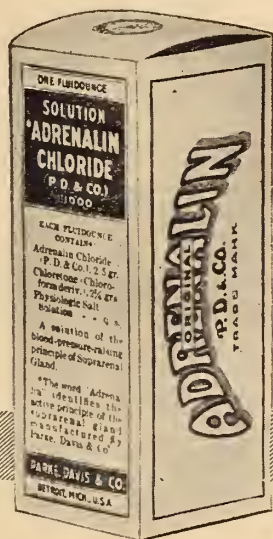
A rebuilt transformer in good condition, Built for radiographic or fluoroscopic work and equipped with Coolidge transformer and control and one medium focus Coolidge tube, one hydrogen tube and three gas tubes. Delivers 40 ma. on 6 inch spark gap. Excellent machine for small hospital or practitioner doing his own x-ray work. Operates on 220 volts, 60 cycle current. Can be had for \$350.00. Tubes and control are worth this.

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Parke, Davis & Company

This Gives Relief



to tired, aching feet, tender heels, cramped toes and bodily fatigue caused by weak or fallen arch. It is light in weight, self-adjusting and easy to wear, affording just the right pressure at the right spot and is indicated in those cases of early foot strain or in incipient flat-foot.

Specify Dr. Scholl's Foot-Eazer which is only one of the many

Dr Scholl's *Corrective Foot Appliances*

Leading shoe dealers in all parts of the world are now prepared to follow physicians' instructions as regards application and adjustment, as they have been instructed through our educational course of training in Practipedics.



Write for copy of valuable pamphlet, "Foot Weakness and Correction for the Physician," and chart of corrective foot exercises as recommended by Medical Department, U.S.A.

THE SCHOLL MFG. CO., 213 West Schiller St., Chicago, Ill.
NEW YORK TORONTO LONDON

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Fairchild Bros. & Foster

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FOR SALE

Vulcan coil for radiographic work. Weighs fifty pounds and operates on 60-cycle alternating current. Coil and two tubes in good shape \$100.00.

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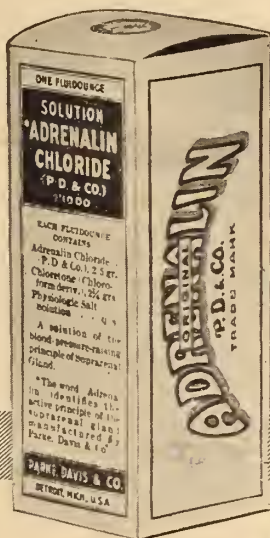
PATHOLOGICAL LABORATORY
Box 1328 **Phoenix, Arizona**

FOR SALE

A rebuilt transformer in good condition, Built for radiographic or fluoroscopic work and equipped with Coolidge transformer and control and one medium focus Coolidge tube, one hydrogen tube and three gas tubes. Delivers 40 ma. on 6 inch spark gap. Excellent machine for small hospital or practitioner doing his own x-ray work. Operates on 220 volts, 60 cycle current. Can be had for \$350.00. Tubes and control are worth this.

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Parke, Davis & Company



Severe Case of Static Flat Foot

is the cause of inefficiency and much bodily suffering. As a physician you will be interested in learning more about a most successful mode of treatment now used by thousands of successful practitioners in the treatment of weak or flat-foot, Morton's Toe, Metatarsalgia, Hallux Valgus, bunion, painful heel, weak ankles and other conditions where mechanical treatment is indicated.

Dr Scholl's *Corrective Foot Appliances*

with proper foot-gear and corrective foot exercises usually bring quick relief to these conditions. There is an appliance especially designed for each condition. They are now placed on sale with leading shoe dealers and surgical instrument houses in every city.

Write us name and address of one nearest you and for the new pamphlet, "Foot Weakness and Correction for the Physician," including a chart of corrective foot exercises as recommended by the Medical Department, U. S. A.

THE SCHOLL MFG. CO., 213 W. Schiller St., Chicago, Ill.

NEW YORK

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Fairchild Bros. & Foster
NEW YORK

6-oz. vials, unlettered, labels readily removed---to facilitate prescription in the original container.

Specialists in the applied chemistry
of the digestive enzymes

Ready for Use!



A scientifically prepared and accurately alkalinized solution of Arsphenamine Squibb, prepared according to the process of Dr. Otto Lowy.

Solution of Arsphenamine Squibb

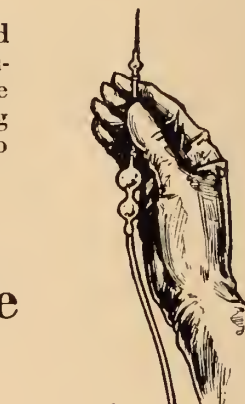
Not a substitute for, but a potent solution of Arsphenamine, eliminating the dangers of oxidation and improper alkalinization; avoiding the necessity for costly apparatus and reagents; and obviating the loss of time spent in preparing solutions extemporaneously.

Prepared under license of the U. S. Public-Health Service and accepted by the Council on Pharmacy and Chemistry, A. M. A. In 80 Cc and 120 Cc ampuls with all attachments necessary to provide for administration with the same ease as a serum or antitoxin.

IF YOUR DRUGGIST CANNOT SUPPLY YOU, ADVISE US. WE WILL MAIL DIRECT TO YOU AT ONCE AND ARRANGE WITH OUR NEAREST DISTRIBUTOR.

Complete
information
on
request

E. R. SQUIBB & SONS
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1859
NEW YORK





Immunization against Diphtheria

DIPHTHERIA is a definitely preventable disease. Accumulated evidence shows that practically all children can be protected by immunization with a *properly prepared* Toxin-Antitoxin mixture.

Such immunity lasts for years.

General immunization in the pre-school period with Toxin-Antitoxin would practically wipe out diphtheria.

The production of the highest degree of immunity depends on the use of an accurately balanced mixture. Over-neutralization lowers its potency. Under-neutralization undermines its safety.

Toxin-Antitoxin, P. D. & Co., is properly balanced to insure the highest immunizing effect consistent with safety.

"DIPHTHERIA IMMUNIZATION," a reprint, sent on request. Write nearest branch: Detroit, New York, Chicago, Kansas City, Baltimore, New Orleans, St. Louis, Minneapolis, or Seattle.

Parke, Davis & Company



Severe Case of Static Flat Foot

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Submitted to the Physician

As a complete gastric gland extract, actually representative of the gastric-gland tissue juice in all its properties and activities, has found wide acceptance as an effective means of dealing with disorders of gastric function.

Of distinct service, also as a detail of other treatment, through improved digestion, improved nutrition.

Gastron---an agreeable, stable solution.

without sugar, without alcohol

Prescribed simply by name---*Gastron*

Fairchild Bros. & Foster

NEW YORK

Ready for Use!

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Solution of Arsphenamine Squibb

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Parke, Davis & Company



Examine Your Patients' Feet for Structural Weaknesses

Weak or fallen arches or flatfoot are often the direct cause of many bodily complaints such as fatigue, nervousness, pain in legs, sciatica, painful heel, cramped toes and rheumatic symptoms. Mechanical treatment is indicated along with properly fitted shoes.

Dr Scholl's *Corrective Foot Appliances*

are especially designed on anatomical and approved orthopedic principles to relieve the cause of the ligamentous strain and correct the abnormal posture. Worn inside the shoes, are comfortable to wear and easily adjustable to meet all conditions as presented to the physician.

Sold at Shoe Stores

Better shoe stores in every locality carry the full line of Dr. Scholl's Corrective Foot Appliances and have also been instructed in how to properly fit them. Write us for the name and address of the dealer

nearest you, Doctor, and let us tell you more about mechanical orthopedics of the foot, which subject is attracting so much attention from the medical profession at this time.

Send Coupon for New Pamphlet

Dr. _____

Street _____

City _____ State _____

Fill out the coupon for your copy of "Foot Weakness and Correction for the Physician"—just published.

The Scholl Mfg. Co.
213 West Schiller Street
Chicago

New York Toronto London, Eng.

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Has the singular strength and power

Of a concrete accomplishment based upon an impelling idea.

Gastron is the result of persistent thought and work of specialists in the chemistry of the digestive glands, and the immediate inspiration of the recent research revealing the complex functions and principles of the gastric gland and its secretions.

Gastron contains, in a potent stable solution, the enzymes and all the associated organic and inorganic principles of the cellular tissue of the entire gland, cardiac and pyloric.

Gastron is proving a distinctly important therapeutic resource.

Gastron is
alcohol and sugar free

Fairchild Bros. & Foster
NEW YORK

"To enable, by simple vaccination, to pick out those who are naturally immune to diphtheria from those who are susceptible, is surely a diagnostic achievement. It is just so much greater because the test is harmless and prevents the unnecessary waste of expensive antitoxin, and it saves large numbers of children the inconvenience and annoyance of the injection itself.

"Far better to vaccinate against a possible infection than take a chance; and, better still, to know with reasonable degree of assurance that such a vaccination is not necessary. Not to take precautions is to stand on a footing with the anti-vaccinationists."

—Louisiana State Health Board Bulletin.

Eradicate diphtheria by immunization

SCHICK TEST SQUIBB is a reliable diagnostic test for susceptibility to diphtheria. A safe guide in determining the need of Toxin-Antitoxin immunization.

DIPHTHERIA TOXIN-ANTITOXIN MIXTURE SQUIBB establishes an active immunity against diphtheria, lasting three years or longer. As easy to administer as typhoid vaccine.

DIPHTHERIA ANTITOXIN SQUIBB is isotonic with the blood. Small bulk, with a minimum of solids, insures rapid absorption and lessens the dangers of severe anaphylactic reaction.

Complete information on request

E. R. Squibb & Sons, New York
Manufacturing Chemists to the Medical Profession since 1858



What Is It Worth To Be *Sure*?

TO the physician treating a case of diphtheria or immunizing a child prophylactically, what is it worth to be sure that the Antitoxin or Toxin-Antitoxin used is absolutely dependable? What is it worth to know that he is fighting the disease with products both safe and potent?

The efficacy of Antitoxin and Toxin-Antitoxin in the control of diphtheria has been definitely established. The dependability of these products is predicated on that of the laboratory which makes them. Equipment, personnel, supervision—all of these must be of a high order to insure a trustworthy product. But above all the laboratory supplying these vitally important immunizing agents must be dominated by ideals of service and must be deeply conscious of its responsibility.

"DIPHTHERIA IMMUNIZATION," a reprint, sent on request. Write nearest branch: Detroit, New York, Chicago, Kansas City, Baltimore, New Orleans, St. Louis, Minneapolis, or Seattle.

Parke, Davis & Company



Metatarsalgia and Callouses Caused by Weakened Transverse Arch

This condition is recognized by depression of the Transverse Arch anteriorly or at the base of the Metatarsal bones. The dome-like arching is obliterated and painful callosities or corns form over the depressed Metatarsal heads. The foot broadens, the toes become dorsal flexed. Bunions appear at the First and Fifth Metatarso-Phalangeal articulations. Digital nerves become impinged and severe cramp-like pains are experienced through the toes. This is described by Whitman as Morton's Toe.

These conditions, Doctor, are quickly relieved and permanently corrected by the use of

Dr Scholl's ***Corrective Foot Appliances***

These appliances are especially designed and constructed to restore the Anterior Arch, remove abnormal pressure and permit full freedom of motion to the entire foot. Different types to meet all emergencies.

Sold and fitted by leading shoe dealers in

every community who have been instructed in Anatomy of the foot and how to properly apply correctives to the foot and shoe.

Important pamphlet, "*Foot Weakness and Correction for the Physician*," mailed upon request.

THE SCHOLL MFG. CO., 213 West Schiller Street, Chicago

NEW YORK

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Gastron is proving a distinctly important therapeutic resource.

Gastron is
alcohol and sugar free

Fairchild Bros. & Foster
NEW YORK

Toxin-Antitoxin

New Formula

This product as originally used by Park of the Research Laboratories of the New York City Department of Health, and as heretofore prepared and marketed by us, has contained 3 L + doses of diphtheria toxin in each dose, properly neutralized with antitoxin.

The directions given for its use provided that it be used on children from six months to six years of age. When used on older children and adults, it sometimes gave a reaction of undesirable severity.

In his more recent work, Park has been using in each dose a product containing 1/10 L + dose of toxin, properly neutralized with antitoxin. The results of his preliminary studies show that an early immunity is produced equal to that established by the former product, and that no severe reactions occur even in older children and adults.

This work demonstrates a very marked improvement in diphtheria control that health officials will welcome, since it will permit the more universal use of Toxin-Antitoxin.

We are prepared to supply this newest product and to give full information upon request.

Lederle Antitoxin Laboratories

511 Fifth Avenue
Corner of Forty-Third Street
New York City

163 Jessie Street, San Francisco, Cal.
601 Firestone Bldg., Kansas City, Mo.



Save the Tenth Child

STATISTICAL data show that approximately 10% of all children having Diphtheria die. Early and adequate Antitoxin treatment would save these children. In meeting this grave responsibility are you sure that your little patients are receiving the best Antitoxin obtainable? Do you have a satisfying consciousness of having done for them all that can be done?

The use of Parke, Davis & Company's Antitoxin inspires just that sort of confidence. For a quarter of a century it has been recognized as the standard the world over. It is potent, pure, and concentrated.

Parke, Davis & Company's Antitoxin is produced in a laboratory possessing unsurpassed facilities. Excellence in achievement here dominates all other interests.

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Parke, Davis & Company

This Is a Weak Foot—

A Condition Most Prevalent Among Women



The fashionable types of shoes, pointed-toe hosiery, excessive use of the feet in walking or standing, pregnancy, heavy weight bearing, etc., are responsible for the vast number of cases.

Remove predisposing cause and apply mechanical treatment and corrective foot exercises. It will help you to build a reputation in your locality. These foot troubles are found everywhere.

Successful orthopedists and general practitioners are prescribing

Dr Scholl's *Corrective Foot Appliances*

which have now been placed in leading shoe stores and surgical instrument houses throughout the country.

These dealers have also been in-

structed in the proper method of adjusting appliances to the foot and shoe in accordance with the principles of the inventor and designer, Dr. Wm. M. Scholl.

Write for Pamphlet—"Foot Weakness and Correction for the Physician," and chart of corrective foot exercises. The subject will amaze you.

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